

United States
Circuit Court of Appeals

For the Ninth Circuit.

Transcript of Record.

(IN THREE VOLUMES.)

STEWART MINING COMPANY, a Corporation,
Appellant,

vs.

JONATHAN BOURNE, Jr., and LILLIAN E.
BOURNE, His Wife,
Appellees.

VOLUME II.

(Pages 321 to 704, Inclusive.)

Upon Appeal from the United States District Court
for the District of Idaho, Northern Division.

FILED

APR 24 1914

United States
Circuit Court of Appeals
For the Ninth Circuit.

Transcript of Record.

(IN THREE VOLUMES.)

STEWART MINING COMPANY, a Corporation,
Appellant,

vs.

JONATHAN BOURNE, Jr., and LILLIAN E.
BOURNE, His Wife,
Appellees.

VOLUME II.

(Pages 321 to 704, Inclusive.)

Upon Appeal from the United States District Court
for the District of Idaho, Northern Division.

(Testimony of Horace V. Winchell.)

Q. In addition to the different points of exposure of the apex of the Stewart vein, are there any other data which assisted you in determining the location of the apex within the Senator Stewart Fraction boundaries?

A. I have already suggested that the stopes above the old tunnel level could not be carried upward to the surface because of the existence of this Clancy fault, and we know from the cross cutting which has been made through the country in the footwall of the Osborn fault that the vein is not there, and we have seen its upward edge so continuously along with its very pronounced structural features, that I think there can be no other conclusion reached, than that this is the approximate position of its upper edge.

Q. What is the course in going from the point of apex that you have described as shown approximately on Exhibit 3, and proceeding on the vein to the ore bodies in the Ontario claim?

A. Do you wish it very exactly?

Q. No, no, I don't mean exactly, but I mean generally; [412—367] is it upward or downward?

A. The course is downward in a southwesterly direction.

Q. To what vein, in your opinion, do the ore bodies in the Ontario in dispute here belong?

A. They are part of the Stewart vein apexing in the Senator Stewart Fraction.

Cross-examination.

(By Mr. GRAY.)

Q. Mr. Winchell, you said something about mon-

(Testimony of Horace V. Winchell.)

zonite and granite in connection with ore deposits in this district. They have nothing to do with the Stewart ore body or the ore bodies in the Ontario?

A. No; I intended to say that there is none of this monzonite in this immediate region.

Q. Your testimony with reference to that was general geological testimony? A. Yes.

Q. And has nothing to do with this case?

A. No.

Q. What do you mean by the width of a vein?

A. The width of a vein is its thickness normal to the [413—368] footwall at any point.

Q. You mean at right angles to the footwall?

A. Yes.

Q. The Osborn fault is disclosed upon the Fir tunnel level I believe? A. Yes.

Q. It is disclosed upon the 300 foot level also, is it not?

A. Yes, at the east end line of the Senator Stewart Fraction.

Q. It is disclosed also upon the 200 foot level?

A. It is.

Q. Would you just go to the plan map and point to the point where it is disclosed on the 200 foot level?

A. On the 200 foot level it is disclosed near station 130,—survey point 130, and from there easterly.

Q. Could you just put a blue mark at that point, Mr. Winchell?

A. I think the 200 foot level plan has it. Plaintiff's Exhibit No. 12 shows the position of the Osborn fault upon the 200 foot level.

(Testimony of Horace V. Winchell.)

Q. Yes. That is the point that you have marked?

[414—369] A. Yes, sir.

Q. Is that disclosed anywhere else on that level?

A. It is.

Q. Where?

A. What we presume to be the Osborn fault is disclosed in drift No. 202 east, near station 2077.

Q. Will you point that out on the plan map?

A. There. I point to it on the plan map, station 2077.

Q. What is the width of the Osborn fault?

A. I presume it varies from two feet to a good many.

Q. What do you refer to when you speak of the Osborn fault, the mere contact between the Pritchard slate and the Burke quartzite?

A. Oh, no, not the contact between the Pritchard slate and the Burke quartzite, but I refer to the plane of movement which is marked by a development of attrition material, more or less clay and ground up and crushed rock, sometimes having a minor thickness, and sometimes being spread out suddenly to a great width.

Q. As you have seen it in that vicinity, what width has it, Mr. Winchell?

A. I think I have not seen it in this immediate vicinity [415—370] more than five or six feet in thickness.

Q. In other words, the fault which was occasioned by these rock masses moving on one another for a mile is in that place only five or six feet thick?

(Testimony of Horace V. Winchell.)

A. Sometimes not more than two feet.

Q. But its thickness where you have seen it is not over five or six feet?

A. In this immediate vicinity.

Q. And that is what you refer to when you speak of the Osborn fault? A. Yes.

Q. I wish you would uncover that Exhibit 10. That is accurate from your own investigation, isn't it, of the property?

A. That represents my idea of it, from all the information I have been able to gather. I have not seen every single foot of the outline.

Q. Then, you do not pretend upon your testimony to say that that is in all respects accurate?

A. Sometimes the outline is indicated in broken lines; that indicates territory which I have not seen.

Q. You did not mention that before. Except where the [416—371] line is broken, the red outline, you do say, however, that that is an accurate representation of that vein upon that level?

A. I think it is approximately correct. I have mentioned the fact that this jog down here was not actually developed and visible to-day, but we have reason to think it was there because of the two small fractures in the ground.

Q. You never were up there to see?

A. You cannot see it now, no.

Q. There is a considerable area between this drift marked drift No. 5 west and the main tunnel level that has not been opened to your observation?

A. No, it has not.

(Testimony of Horace V. Winchell.)

Q. You are simply laying the vein as you have it there because you believe it is folded and is approximately flat for a distance between those two workings?

A. Yes, and because in raise 3 east it is possible now to go up and see the fold and the vein appearing in both directions, north and south of that point. [417—372]

Q. And that is caused by a fault which runs in a somewhat northerly and southerly direction through there between those two workings, isn't it?

A. Well, perhaps we might not agree as to which is cause and which effect. I think the fault is caused by a little fold in the rocks and marks the displacement, but the fault did not cause the bend.

Q. But there is a fault through there, that you concede? A. Yes, sir.

Q. When you referred to the work of the sill floor there, you did not intend to convey the impression that the vein had that width?

A. No; I said the apparent width upon a horizontal plane there is not to be understood as giving a thickness to the vein of so great a distance.

Q. Has ore been removed from the areas represented here in red between this south drift and the main tunnel level?

A. There are stopes just above this sill floor reaching over part way to a connection with the sill floor stope on the north side; I do not know how continuously. [418—373] They are shown upon the stope map.

(Testimony of Horace V. Winchell.)

Q. There is a considerable area in there where the vein has not been mined?

A. Where there is either no mineable ore or for some reason it has not yet been mined. There is very good first class ore still remaining visible at several points on the sill which has not been stoped.

Q. Is the Deering crosscut shown on that plan?

A. Yes, sir.

Q. You have not been throughout the length of that level from the Deering crosscut to its southerly face?

A. Yes, sir. A great deal of this old working is very closely lagged; the ground is evidently heavy and difficult to hold it and it is impossible to get an entirely satisfactory view of the details.

Q. Throughout that entire length that level is within the vein? A. Yes, sir.

Q. And the general course between those two points is what?

A. South 28 west, average course. Taking a straight line connecting the southern end of the old lower tunnel [419—374] level and the intersection of the Deering crosscut with the vein it is upon the same level. There is a crosscut at this southern end.

Q. What did you say?

A. I have measured here from the footwall to the hanging-wall.

Q. I would be just as glad to have you measure from hanging to hanging? A. Thirty-one.

Q. South thirty-one.

A. South thirty-one degrees west.

Q. And that distance is how much, Mr. Winchell?

(Testimony of Horace V. Winchell.)

A. About eight hundred feet. It is seven hundred and some odd feet in—I cannot tell you without I scale it. (After scaling map.) Seven hundred sixty-five feet approximately.

Q. The black lines going in a northerly direction from the level represent the raise at the apex tunnel?

A. No, sir.

Q. What does that— A. That raise—

Q. Raise 4 east. I see, raise 4 east. [420—375]

A. I have never been in that raise; I don't know.

Q. You have never been in there.

A. I have been in that raise; I am mistaken; and it does connect with the Apex drift.

Q. I thought it did.

A. I thought you referred to something near the eastern end, but it does connect with the Apex drift and it follows the stopes almost to the Apex drift.

Q. Will you give me the course from the hanging-wall at that raise to the hanging-wall at that crosscut?

A. You are indicating the footwall.

Q. I mean the footwall. To the crosscut face—or to the footwall at the crosscut south, face of that level.

A. South thirty-three west.

Q. The Exhibit 10 you have referred to as showing the irregular outline of the vein, and in referring to that you referred to the easterly portion of the vein or the northerly portion of the vein shown thereon?

A. Yes, sir.

Q. Northeasterly. And that is caused by the flattening of the vein there which you have referred to?

A. Yes, sir. When a vein is flat it is evident that

(Testimony of Horace V. Winchell.)

[421—376] upon a plan map a change of the dip of a very few degrees will make a very marked change in the apparent strike of the vein; in other words, if you have a vein which dips two degrees south and it should change in dip two degrees north you would have an entirely reversed dip and yet only a change of four degrees in that dip, and in a section through there it would show the vein dipping the opposite direction.

Q. Yes, sir. Now, then, the 100 level, please. The plan of the 100 level which has been introduced in connection with your testimony, Exhibit 11, in large measure represents sections and portions of that level which you have been unable to penetrate and examine, in the ground, does it not?

A. Yes, sir, a considerable portion of the level is not open to examination now.

Q. Been caved for—

A. I don't know how long, but it is caved.

Q. What portion of that level were you able to get into?

A. In raise 218 east, the eastern end of the stopes can be seen. The vein can be seen southerly from the [422—377] shaft upon this level.

Q. How far?

A. Only for a short distance northerly and southerly.

Q. Approximate it.

A. Well, it is caved right around—

Q. You can only see it for a few feet?

A. Only a few feet.

(Testimony of Horace V. Winchell.)

Q. Up here at the northern end how far can you observe the vein there?

A. You cannot see it, but we have the stope maps—

Q. Just the end of the stopes?

A. Yes, sir, and the stope maps show the position.

Q. And between those two points, of course, you have made no examination yourself? A. No.

Q. And do not know what it discloses. And the fact is that the same is true of the 100 level from a point just a few feet from the shaft on southerly?

A. That is true.

Q. Now, let us have the level just below that. That level so far as it is disclosed on there, you have not been in? [423—378]

A. I have, throughout its length practically all the way. I have not seen the full width of the vein at some places where it is indicated here, but the vein and the indications of stoping and vein material can be seen from one end to the other.

Q. I note that you have certain blue lines on the section. What do those represent, Mr. Winchell?

A. The tracing of faults.

Q. I see. You have one in the drift 202 east?

A. Yes, sir.

Q. You also disclose on there the No. 11 fault?

A. Yes, sir; that fault is seen upon the level and in the stopes just above where the vein passes through it without visible displacement.

Q. The width of the vein upon that level according to the section which you have prepared differs as you follow along the level? A. Yes.

(Testimony of Horace V. Winchell.)

Q. Is that because of local folds or flattening of the vein at places?

A. I should not think so so much in this case, but rather the irregularities of mineralization or replacement [424—379] of the quartzite country.

Q. To some extent it is by reason of the—

A. I presume in places it is flatter than at other places.

Q. Just west of what is marked R 304 east and north of the words drift 205 east the vein is shown at a considerable width; is that width disclosed on that level or is it projected upon the plane of the section?

A. It is shown in the first floor above the level.

Q. In the first floor?

A. The first floor as indicated here.

Q. From this first floor it is projected on to the plane of the section? A. Yes, sir.

Q. What is the width of the vein at right angles to the footwall there? A. I don't know.

Q. Now, if you will take the level just below. Exhibit No. 13, 300 level, is there anything projected on to the plane of that section, Mr. Winchell?

A. The outline of the vein is placed upon the section from what can be seen upon the sill and the first [425—380] floor and the first floor stopes are traced upon this Exhibit 14 in orange. They prove actual stoping widths for the distance to which they are developed, and we know that the vein in its widest part has the width shown upon the section. There is some little projection.

Q. Projection on to the plane of the section. Upon

(Testimony of Horace V. Winchell.)

the level and leaving out of consideration the stopes above the level which you have projected on to the plane thereof, what is the width of the vein as actually disclosed upon that level?

A. Substantially as shown upon Plaintiff's Exhibit 13 along the south side line of the Senator Stewart Fraction.

Q. You have extended that vein upon that claim from what is marked thereon "300 lateral" to the drift in which you find the station 2016?

A. Yes, sir.

Q. What is your justification for doing that, Mr. Winchell?

A. Because that is all vein material.

Q. How do you know?

A. Because I can see it. [426—381]

Q. Any faults in there?

A. Oh, there are numerous little slips running around in various directions, but the vein is perfectly visible and contains very good ore.

Q. What is the width of the vein at right angles to the footwall there?

A. I don't know; it is rather flat there.

Q. That gives it the apparent width that is shown upon the sill floor?

A. Yes, and that flat portion extends downward into the stopes and very large and wide stopes showing the veins to be flat between there and the 400 level below.

Q. That extends over on that level into what is known as the Gray ore body in the Ontario?

A. It does. It extends over until its connection

(Testimony of Horace V. Winchell.)

with the top of the stopes in the Gray ore body.

Q. Then the No. 11 fault comes in there and you find the Frank ore body on beyond the No. 11 fault?

A. The Gray ore body is north of the No. 11 fault and the Frank ore body south.

Q. Mr. Winchell, upon that little level you can start [427—382] upon the vein as it comes against the Osborne fault and walk along that level until you walk into the ore bodies in the Gray stopes within the Ontario, do you not, as shown upon your plan?

A. Yes; you walk into a connection with those stopes.

Q. Walk within the vein all the time?

A. Yes, sir.

Q. And upon the level. Is that correct?

A. Practically level, yes, sir.

Q. An then after bridging the fault you find the Frank stopes, the Frank ore body, on the same level?

A. Yes, sir.

Q. Now, if you will kindly put up the 400. This Exhibit 14, the 400 level, is there anything projected on to that, on to the plane of that section?

A. There is. There is no immediate connection between the vein as shown in the lateral just west of the shaft, south of the shaft, and the drift known as the Gray drift upon the Silver King tunnel level. The elevation is not precisely the same, of the two levels, but they are so closely the same that they can be shown upon the same plan. The outline of the ultimate limits of the [428—383] vein may vary from its position as shown upon this map. The flat

(Testimony of Horace V. Winchell.)

stope that I refer to as shown upon plaintiff's Exhibit 13 running down is the upper portion of this long tunnel shown upon Plaintiff's Exhibit 14.

Q. There was one thing I wanted to ask you; what is the scale of all of these maps?

A. Thirty feet to one inch.

Q. The section four which corresponds, I presume, with the section four Mr. Clancy has testified concerning, is shown on this Exhibit No. 13?

A. Yes, sir.

Q. Will you tell me how far from that section the footwall of the vein as you have disclosed it upon that Exhibit 13 is along the Osborne fault?

A. Along the fault?

Q. Yes, sir.

A. It is about ninety-two or three feet.

Q. Yes, sir. On the same level that section passes right through the center of the ore body in the Gray stopes within the Ontario, doesn't it? A. Yes, sir.

Q. And the distance from the Osborne fault, the point [429—384] which you measured, from there to the lowest point at which you have shown the Gray stopes, that is, the southern end of your stopes upon your plan is how many feet? A. About 650 feet.

Q. The course of that section four is south twenty-four west, I believe.

A. Parallel to the east end line of the Senator Stewart Fraction.

Q. On the 400 level I see also depicted the section 6 which is the same one which Mr. Clancy has testified to? A. Yes, sir.

(Testimony of Horace V. Winchell.)

Q. As that section crosses the Osborne fault shown upon your plan how far is it to the west of the hanging-wall of the vein on that level?

A. Measured along the fault, the difference is approximately one hundred feet.

Q. That line of section passes just beneath the Gray drift on that level? A. Yes.

Q. And the course of that section is parallel also to the east end line of the Senator Stewart Fraction?

A. It is. [430—385]

Q. And the distance between the two points that you have measured is how many hundred feet?

A. It is about 760 feet.

Q. And then after passing over a small fault, or passing beyond a small fault into the May drift and the No. 11 fault you come into the Frank ore body still further to the south? A. Yes, sir.

Q. And the course of that ore body is what?

A. About south 36 west at that point—for that distance.

Q. What did you say?

A. About south 36 degrees west for that distance.

Q. I understood you to say that where the solid red lines are shown upon the exhibit you by your own investigation are able to place the vein upon that section?

A. Well, I see that the draftsman has connected the line more continuously than I supposed—

Q. More continuously than you would from your investigation?

A. Yes; you cannot actually see that boundary of

(Testimony of Horace V. Winchell.)

the vein; it is broken on one side and indefinite on the [431—386] other.

Q. Yes, sir; taking the red line on the eastern side representing the eastern wall of the vein upon that level at the point where you have depicted the Osborne fault and from there to the shaft there is really no working on that level extending out that far, is there?

A. No, but on the first floor above the level we have ore nearly as far.

Q. Yes, sir. I noticed when you placed the first floor above the level upon the map you have extended that to the westerly end of those stopes and you give to the vein upon this level a greater width than it apparently *it* has in the stopes above. Why do you do that, Mr. Winchell? What justification is there for believing that the vein is wider on that level than it is in the stopes above?

A. That is not always so; that is not intentional in any way; but in the 409 crosscut we know where the vein is and what its dip is, and we have it down here on the sill floor.

Q. Coming back to the question I just asked you, what justification is there for making the vein wider [432—387] upon that level than it appears in the stopes above the level from which you get its width at that point?

A. The observations which we have been able to make in both places. The 409 crosscut is upon the level, it is not in the stopes, and we have the ore and the vein in that crosscut, and we have not reached

(Testimony of Horace V. Winchell.)

its limit. The drift 415 east is on the sill floor and we have not reached the limit of the ore there or the vein. Consequently we are justified in drawing it some distance beyond the point where we actually see it and we have given it that position. We have it also in the drift which discloses the Osborne fault upon that level. It might be a few feet one way or the other.

Q. You also have the vein—what was the width of the vein as disclosed by the shaft which you—is that shaft in the vein? A. No, sir.

Q. It is under the vein? A. Yes, sir.

Q. I notice a raise here marked raise 471 east; is that in the vein?

A. That is in the vein. [433—388]

Q. The raise 400-A, is that in the vein?

A. It is part way; I do not think it is all the way.

Q. It goes through the vein, does it?

Thereupon an adjournment was taken until 2:00 o'clock P. M. of this day, Thursday, January 9, 1913.
[434—389]

2 P. M. Thursday, January 9th, 1913.

HORACE V. WINCHELL resumed the stand for further

Cross-examination.

(By Mr. GRAY.)

Q. Mr. Winchell, on the 300 level map, Exhibit 13, you show the line No. 4 through the Gray drift. What is that drift upon the section introduced by Mr. Clancy, Exhibit No. 4?

A. This is the Gray drift.

(Testimony of Horace V. Winchell.)

Q. The drift connecting the Gray drift?

A. The 300 foot level.

Q. The 300 foot level connecting the Gray drift—

A. No, it is above the Gray drift.

Q. It is connecting with the Gray ore body in the stopes of the Gray, isn't that true?

A. The south end of this drift connects with the stopes.

Q. And that is a drift on the vein? A. Yes.

Q. Show me where that is on Exhibit No. 4 being section 4. [435—390]

A. The point where the cross-section on Plaintiff's Exhibit 13 enters the 300 foot level or passes through the level is shown upon Exhibit No. 4 in the red band about 70 feet to the west or south of the line which indicates the Ontario west end line.

Q. Just point on that map. A. Here.

Q. That line also runs in that vein on that drift, doesn't it?

A. As indicated it does; I have indicated that by the red.

Q. But it is not shown on section 4, Exhibit 4 there, is it?

A. I think it would be more accurate to represent the position of the drift upon the section at a greater distance than it has been shown.

Q. That is on section 4?

A. On section 4, Exhibit 4.

Q. Now, going back to Exhibit 14 on the 400 foot level, I referred to a raise which is marked raise 400A. Isn't there another shaft—another raise just

(Testimony of Horace V. Winchell.)

south of the shaft, Mr. Winchell, that is not shown on that plan? [436—391]

A. Do you mean another raise or another shaft?

Q. Another raise.

A. There is a raise south of the shaft station.

Q. That is not shown on Exhibit No. 1 or on your Exhibit No. 14?

A. It would lie directly underneath the working shown on the 300 foot level on Exhibit 1.

Q. But it is not shown there so that you can see it.

A. No, it is not.

Q. And it is not shown on your Exhibit No. 14?

A. No, sir.

Q. Now, in order to be an accurate plan, that ought to be on there, shouldn't it?

A. Yes, in order to show all the workings, it ought to be there.

Q. Now, that is on the plane of this section, I mean it is on the level of the 400, Exhibit 14?

A. I think the raise starts from this level, yes.

Q. Within what you have marked there as the vein? A. Yes, sir.

Q. Is that raise entirely in the vein, Mr. Winchell?

A. I don't know; I have not been up it. [437—392]

Q. Haven't you? A. No, sir.

Q. Isn't it true that, in order to determine the width of the vein here and again on the level that you should have gone up that raise?

A. I should have gone up if it was open, but I don't know that it was.

Q. You don't know whether it is open or not?

(Testimony of Horace V. Winchell.)

A. No.

Q. You have it in your note-book, though?

A. Yes.

Q. But you didn't go up it and you don't know what it will show as to the width of the vein?

A. No, I don't know. I don't suppose it would disclose the full width of the vein anyway.

Q. Now, going over to the point on the 400 foot level, Exhibit 14, where you show the vein cut off by the Osborn fault, there is what is marked "Raise" there to the north of the Osborn fault? A. Yes.

Q. And you show the vein in the little extension of the 400 foot level along the Osborn fault? [438—393]

A. Yes.

Q. Is there any other raise at that point or within a few feet, which is not shown upon this plan?

A. There is another raise. There are a good many raises that are not shown on these plans.

Q. Yes. I refer to one about 10 feet west of the raise that is shown. A. Yes.

Q. And that raise goes up about how far?

A. I don't know; I have been up that raise to the top of the ore in it.

Q. Is there ore in that raise?

A. I have been up the raise on the fault.

Q. Point it out to the Court so that he will see just where it is.

A. The raise is just west of 415 east raise, and I recall starting and seeing ore at the foot of that raise.

Q. Is there any ore in that raise?

A. I don't recall distinctly any ore in the raise.

(Testimony of Horace V. Winchell.)

It goes off up there. I think there is ore in the raise.

Q. You would not be prepared to say that there was?

A. Well, no; I think a little ways to the west of [439—394] there we find ore going up on that.

Q. I am speaking of that raise now.

A. I will see if I have any notes. No, I am not prepared to state that there is not ore extending up that raise for a considerable distance.

Q. Now, then, going to the tunnel level, I want to call your attention to the raise which runs in a north-westerly direction upon Exhibit No. 10 from the red line which you show as the footwall of the vein on that level; is that raise No. 6 W.?

A. Yes, I think so.

Q. Did you go up that raise?

A. Up to an intermediate level, I did.

Q. You did not go up beyond that?

A. I followed some distance further up through some old stopes.

Q. That raise is a raise on the vein? A. Yes.

Q. What is the dip of the vein as disclosed in that raise?

A. It is considerably steeper than the vein upon this floor. I don't recall the exact dip. [440—395]

Q. You cannot give us the exact dip? A. No.

Q. Did you follow along this what you call the intermediate level on Exhibit No. 1?

A. For about two-thirds of its distance to the north.

Q. That is, over to the bend?

(Testimony of Horace V. Winchell.)

A. To the bend and just beyond the bend.

Q. That was in vein? A. Yes.

Q. What was the course of that drift as far as you followed it from the point where you got into it to the point where you quit following it?

A. About north 25, east.

Q. There are some other raises up along there above the tunnel level, are there not, Mr. Winchell?

A. There are.

Q. Did you go up any of those other raises to the south of the one now that you have referred to?

A. I think I went into every raise that is accessible.

Q. What was the dip of the vein as disclosed in those other raises to the south?

A. About 45 degrees. [441—396]

Q. And the direction of the dip in those raises?

A. To the southeasterly.

Q. What was the course?

A. Well, the course of the raise or the dip of the raise?

Q. The course of the dip as disclosed in the raise.

A. Well, the dip is not disclosed in the raise.

Q. The direction of the dip?

A. Neither the direction of the dip nor the dip itself are necessarily disclosed in the raise. The raise is within the limits of the vein.

Q. And you were not able to get it in those raises?

A. No. No observation taken of such a point would disclose the true dip or strike of the vein.

Q. Now, go back to Exhibit No. 1, the plan map,

(Testimony of Horace V. Winchell.)

and I want you again to point out to me where it was—did you mark where on the 200 foot level you had the Osborn fault disclosed?

A. I have marked it now.

Q. That is along about station 129?

A. From station 129 easterly.

Q. Now, where did you have it disclosed in the Fir [442—397] tunnel level?

A. It is disclosed a short distance east of station 2519.

Q. And where else on the Fir tunnel level?

A. What I suppose is the Osborn fault, though there is not any very satisfactory development, is in the north end of what is called the 400 north crosscut.

Q. Now then, what is the difference in elevation, vertically, between the points in the end of the 400 north crosscut and the 200 level that you have referred to as disclosing the Osborn fault?

A. Approximately 160 or 165 feet.

Q. Is there any place else on the 200 foot level where it is disclosed, Mr. Winchell?

A. Yes; I find a fault upon the 200 foot level near station 2077 which I connect with this Osborn fault as shown at the eastern end of the level.

Q. What is the steepest dip of the Osborn fault that you have been able to ascertain in your investigation of this property?

A. I should think its steepest dip was about 70 degrees.

Q. What is the vertical distance between the points [443—398] where you have seen it near this station

(Testimony of Horace V. Winchell.)

2077 and the north end of the 400 north crosscut?

A. The elevation is not given of the north end of the 400 north crosscut, but it is not far from perhaps 2603, or something like that, which would make the vertical distance about 155 or 160 feet.

Q. And the horizontal distance between those two points is what? A. About 175 feet.

Q. Isn't it more than that, Mr. Winchell—all right, take it at 175. What is the angle, then, of the dip between those two points?

A. That would be about 40 degrees. We know that the Osborn fault does flatten going in that direction.

Q. In your judgment, which is the older, geologically, the vein or the fault, Mr. Winchell?

A. The vein.

Q. What was the condition, in your judgment, as to a vein continuing on in the general direction of this vein prior to the faulting?

A. I presume there was a vein in that ground, which was first bent and then faulted, and that the vein did [444—399] continue in some direction beyond where the Osborn fault now terminates it. That portion of the vein was up in the air and is now—

Q. That is after the faulting?

A. —is now in that portion of the country which is now up in the air, and there are no rocks and no veins. [445—400]

(Testimony of Horace V. Winchell.)

Redirect Examination.

(By Mr. DINES.)

Q. Mr. Winchell, you were asked about going on the 300 level, if you could not go on the 300 level from the Gray and May ore bodies to the Stewart vein near the easterly end of the Stewart claim. What part of the Stewart vein could you go on that level?

A. We followed the vein in a somewhat winding course around near its footwall upon this level, but not in a direction immediately parallel to the east end line of the Senator Stewart Fraction. We followed through one of the flat places in the vein.

Q. What part of the May and Gray ore body does that go into?

A. It reaches the stopes above the Silver King tunnel level upon the Gray ore body.

Q. And how do you go from those stopes into the level?

A. Down a considerable distance, down a raise or down through the stopes.

Q. And how do you get to the points of apex on the Stewart vein on that level as detailed out toward the [446—401] end line?

A. A portion of the vein is above the level of the 300 at the apex and a portion of it is immediately upon the level.

Q. How do you reach that portion that is above the level?

A. That is in the stopes just over the sill.

Q. Are there any other upraises than the one you have referred to in the Ontario ground that you have

(Testimony of Horace V. Winchell.)

to go through in reaching the point in question?

A. Yes. There is another—to reach the Frank ore body?

Q. Yes, sir.

A. We can go down another raise likewise a similar distance to reach the Silver King tunnel level, stopes made upward upon the Frank ore body and continuing now are as high as the level or higher. I did not answer the other question, the preceding question, completely. 218 east raise shows the—no, I am mistaken again; that is the stopes. We find the dip of the ore in the stopes above the 300 level just west of the end line.

Q. Right in the stopes or is it above? [447—402]

A. In the stopes and above; a portion of the vein appears on the level, a portion of the apex on the level and the remainder of the apex above the level in the stopes and along running up raise 314 east.

Q. Now, on Exhibit 1 there are some workings in the Lazy Jean and Switchback, which appear to be out in the Switchback and running down on the ore body; how do you account for it being practically on a level with this 400 level?

Mr. GRAY.—I object to this as improper redirect examination; it seems to me if counsel is going over these things he ought to do it in direct examination.

The COURT.—Objection overruled.

A. The ore body represented in this tunnel upon Plaintiff's Exhibit 14 is not a portion of the main course of the vein. It is one of the irregular bodies of mineralization extending out into the hanging-

(Testimony of Horace V. Winchell.)

wall country and at this point very flat.

Mr. DINES.—That is all.

Witness excused. [448—403]

[Testimony of Alfred Frank, for Plaintiff.]

ALFRED FRANK, called as a witness on behalf of the plaintiff, being first duly sworn, testified as follows:

Direct Examination.

(By Mr. GUNN.)

Q. State your name to the stenographer, Mr. Frank. A. Alfred Frank.

Q. I understand you are a mining engineer by profession? A. Yes, sir.

Q. Are you a graduate of any technical school, and if so, what school?

A. I am. I am a graduate from Cornell University as a civil engineer in the year 1898.

Q. And what experience have you had in the line of your profession and work?

A. About the first of February, 1900, my experience in the mining business and as a mining engineer started. At that time I obtained employment in Butte as a surveyor or assistant surveyor in the mines there, and I have since that time been continuously engaged in the [449—404] profession of a mining engineer, having at various times filled positions as mine surveyor, shift boss, foreman, superintendent and manager of mines.

Q. Has your experience covered any other section of country than that of Montana?

A. Yes, sir. For the past two and one-half years,

(Testimony of Alfred Frank.)

I have been general manager of the Ohio Copper Company with headquarters at Salt Lake City, the mines being located at Bingham, Utah. During the past ten years I have made examinations in various parts of the country, including Montana, Idaho, Nevada and Utah and also in Mexico, Alaska and British Columbia.

Q. I take it that your experience has been principally with quartz mining properties?

A. Yes, sir.

Q. Are you acquainted with the property in controversy in this litigation? A. I am.

Q. When did you first visit that property and become acquainted with it?

A. I first visited the Stewart mine in the fall of 1906; it was probably the month of September or October, [450—405] and since that time I have at varying intervals and over varying periods visited the mine very frequently.

Q. Have you recently made an examination and investigation of the property with a view to qualifying yourself to testify in this case? A. I have.

Q. To what extent has your investigation and examination gone, speaking with reference to the workings in the property?

A. During the period covering all the time from that I first mentioned, that of my first visit to the mine in the fall of 1906 and until the present time I have visited the mine very frequently always with a view—in the capacity of consulting engineer and in connection with the actual operation of the property.

(Testimony of Alfred Frank.)

At such times I naturally visited and examined practically all of the operating faces which were open, and during the past few months I have re-examined all of the workings at this time accessible, or I should probably say nearly all of the workings at this time accessible.

Q. Could you turn to the map and briefly outline the portion of the workings which you examined at the [451—406] time of your first acquaintance with the property in 1906?

A. At the time I made my first visit to the property in the year 1906 I entered and examined the workings designated on this map as the upper Stewart tunnel level.

The COURT.—This is Exhibit 1, Mr. Reporter.

A. Yes, sir, on Plaintiff's Exhibit 1. Also, the workings designated on Plaintiff's Exhibit 1 as old lower Stewart tunnel which at that time was extended to the point somewhere in the neighborhood of the workings marked Samuels raise; I am not positive as to the exact extent of the workings at that time, and without referring to old maps in use at that time would not attempt to locate the definite extent of those workings at that time. Also, the workings marked hereon as drift 1 E. and drift 2W in the 35 foot level, all of which existed in part, at least in part at that time.

Q. Are you also familiar with the workings beneath the surface of the Ontario as depicted on that map Plaintiff's Exhibit 1?

A. I am familiar with the workings beneath the

(Testimony of Alfred Frank.)

surface of the Ontario as depicted on Plaintiff's Exhibit 1 with the exception of the working colored red, and which [452—407] is a lower working than that of the Silver King tunnel. I have not visited that—I have not entered that working.

Q. Directing your attention to the workings easterly of a line at right angles to the south side line of the Senator Stewart Fraction claim drawn through the top of raise No. 2 west, I will ask you how many veins are disclosed in those workings.

A. There is one main vein disclosed in those workings, which vein of course has in some instances smaller more or less important off-shoots in one direction or another.

Q. What evidence is there in the ground from which you draw the conclusion that there is but one vein?

A. These workings are all extended on a vein and on ore bodies mined continuously and connecting one with the other, and where crosscuts do extend out to one side or another of this vein they encounter nothing other than in some instances the more or less important off-shoots from this vein which I have mentioned.

Q. Then are we to understand that the ore bodies in the Ontario are considered by you to be part of the same vein as the ore bodies in the Senator Stewart Fraction?

A. Yes, sir, they are. They can be traced by—[453—408] they can be connected by tracing of continuous workings on openings made in the course

(Testimony of Alfred Frank.)

of mining operations, such openings being made in part from and by the workings of the Ontario but mainly by and from the workings of the Stewart Mining Company.

Q. State whether or not any top of the apex of that vein is to be found within the lines of the Senator Stewart Fraction claim?

A. It is. The apex of that vein is found crossing the easterly end line of the Senator Stewart Fraction claim at a point near the center of this easterly end line, and a projection on a plan or horizontal surface of this apex would show it as depicted on Plaintiff's Exhibit No. 3, that is, first in a northwesterly direction, then bending around and assuming a southwesterly direction.

Mr. GUNN.—I would ask to have this model marked for identification.

The COURT.—It will be marked Exhibit 15— isn't it?

Mr. GUNN.—Yes, sir.

The said model was thereupon marked Plaintiff's Exhibit 15 for identification. [454—409]

Mr. GUNN.—Directing your attention to the model which has just been identified as Plaintiff's Exhibit 15, I will ask you what that model was intended to illustrate or represent.

A. This model was intended to illustrate and represent the apex of the Stewart vein, its relation to and its position on the Osborne fault, its position at the uppermost point of the bend which is shown on Plaintiff's Exhibit 3, and also its relation to and

(Testimony of Alfred Frank.)

position under what is known as the Clancy fault. The model shows the apex of the vein and its continuation downward, that is, the continuation downward from this apex to a point a short distance southerly from the south side line of the Senator Stewart Fraction claim.

Q. State under whose direction and supervision that model was made and from what data, if you know :

A. The model was made from data gathered by the engineers of the Stewart Mining Company, all of which data agrees with and checks with the maps heretofore introduced, and particularly the map marked Plaintiff's Exhibit 1, and while the model was not constructed by myself I assisted in the construction thereof and observed and examined [455—410] carefully the drawings from which it was constructed.

Q. What is the scale of that model, if it has a scale? A. Forty feet to the inch.

Q. Is it thirty?

A. I believe this model is on a forty scale.

Mr. GUNN.—We offer the model in evidence.

Mr. GRAY.—I want to examine him some about this model before we receive it. I can do that, though, on cross-examination. You can go right ahead.

Mr. CULLEN.—You can do it now, if you want to.

Mr. GRAY.—No, I will wait until he is through with Mr. Frank.

(Testimony of Alfred Frank.)

The COURT.—You can proceed with the examination of Mr. Frank.

Mr. DINES.—It can be used, I suppose, for illustration by this witness?

The COURT.—Yes, sir; I will let Mr. Gray cross-examine him and hear his objection before I will admit it in evidence, but you can use it for the purpose of illustrating the evidence.

Mr. GUNN.—Very well. [456—411]

Q. If the surface lines of the Senator Stewart Fraction claim are shown on that model, please point them out to the Court.

A. The east end line of the Senator Stewart Fraction claim is drawn on the top glass, the glass forming the top of this model as *it* also the line representing the south side line of the Senator Stewart Fraction claim.

Q. Explain what the red lines shown on that model are intended to illustrate.

A. The red lines painted on the various sheets of glass forming the sectional parts of this model represent the Stewart vein on its downward course into the earth and beneath the surface of the Senator Stewart Fraction and in part beneath the surface of the Senator Stewart claim.

Q. What are the heavier blue lines against which most of the red lines terminate intended to represent?

A. They represent the Osborne fault as it is cut by the various sections of which this model is composed,

(Testimony of Alfred Frank.)

by the planes of the various sections of which this model is composed.

Q. I notice also some lighter blue lines extending [457—412] almost at right angles to the heavier blue lines; what do those represent?

A. These represent what is known as the Clancy fault and against which the vein in the westerly and southerly part of the Senator Stewart Fraction claim finds its apex.

Q. And in looking through the model we notice some black marks, squares, and different figures. What do those represent?

A. They represent the workings, the mine workings cut by the planes of section represented by the separate sheets of glass.

Q. What have you to say regarding this model illustrating or representing the location of the Stewart vein and the Osborne fault and the relation of one to the other and the relation of both with reference to the surface lines of the Senator Stewart Fraction claim?

A. It correctly represents these in so far as the maps from which it is constructed are correct. Of course, I cannot, not having made the surveys from which the working maps of the Stewart Mining Company and the working maps which are used in this case—I cannot testify as to the correctness, the absolute correctness nor accuracy [458—413] of these maps, but the model is correct in its representation of the same conditions as illustrated on these maps, and the model is constructed mechanically and

(Testimony of Alfred Frank.)

mathematically from these maps.

Q. Then, assuming that the maps are correct and the survey and data from which the maps were made were correct, what have you to say regarding the correctness of this model so far as it purports to represent measurements and—I am speaking of the maps that have been offered in evidence here as Plaintiff's Exhibit 1 and any other maps containing data that has been used in the preparation of this model?

A. This model is correct.

Mr. GRAY.—It occurs to me that we ought to have these—if it is prepared from some other maps that have got something else on them, that we ought to at least be able to see them.

A. I could probably add to that, that it is prepared from a map which is an exact duplicate of this map except in so far as it is drawn on a different scale.

Mr. GUNN.—Q. "This map," Plaintiff's Exhibit 1?

A. In fact, Plaintiff's Exhibit 1 is copied from—[459—414] largely copied from the same map which was used in the construction of this model.

Q. Then I will ask you to what extent the data from which this model is made is shown upon the map introduced in evidence as Plaintiff's Exhibit 1?

A. The data from which this model is made checks and corresponds with that from which Plaintiff's Exhibit 1 is made and on which Plaintiff's Exhibit 1 is based.

Mr. GUNN.—Do you want to conduct the cross-

(Testimony of Alfred Frank.)

examination before the model is accepted in evidence?

Mr. GRAY.—Yes, sir, but I will wait until you are entirely through with Mr. Frank. Go ahead.

Mr. GUNN.—Q. Directing your attention again to the plan map Plaintiff's Exhibit 1, I will ask you whether or not the ore bodies in the Ontario are on a lower or higher plane than the plane of the apex which you have referred to in the easterly portion of the Senator Stewart Fraction claim?

A. The ore bodies in controversy beneath the surface of the Ontario claim are lower in elevation than the elevation of the apex contained in the easterly part of the Senator Stewart Fraction claim and which apex has before [460—415] been referred to by me in my description of the model.

Q. State whether or not there is any point along that apex on a line parallel with the easterly end line of the Senator Stewart Fraction claim that would cut any part of the Ontario claim that is not on a higher plane than the plane of the ore bodies or vein in the Ontario plane.

A. If a plane parallel to the easterly end line of the Senator Stewart Fraction claim be taken at a point through the furthestmost west part of the Ontario claim, this plane would cut a section of the apex of the Stewart vein higher than the workings in the Ontario plane.

Q. State whether or not that is true with reference to any plane that could be taken between the plane that you have just referred to and a plane

(Testimony of Alfred Frank.)

drawn through the easterly end line of the Senator Stewart Fraction claim.

A. The same is true. Any plane taken between the easterly end line of the Senator Stewart Fraction claim and parallel to this end line will cut through the workings in the Ontario plane, through the ore body contained within the workings in the Ontario claim, at a point lower than that at which it cuts the apex of the [461—416] vein in the Senator Stewart claim.

Q. Now, directing your attention to the workings on the map—the westerly portions of the Senator Stewart Fraction and the Senator Stewart claims, and I will ask you what, if any, relation the vein and the ore bodies in those workings have to the vein which you have referred to as the Stewart vein disclosed in the easterly workings.

A. They are on the same vein and on the same ore body.

Q. Read the question to him; I do not think the witness understood it.

(Question read.)

A. I assumed you meant these workings right here (indicating).

Q. To make myself more definite, I will ask you what relation, if any, the vein or veins and ore bodies west of the line drawn through the southerly side line of the Senator Stewart Fraction claim at right angles thereto at the top of raise No. 2 have to the workings easterly of that line or the vein disclosed in those workings.

(Testimony of Alfred Frank.)

A. They are on separate and distinct unconnected ore bodies, ore bodies and veins which are not connected in any way with the workings in the Senator Stewart and [462—417] Senator Stewart Fraction claims on the Senator Stewart or on the Stewart vein.

Q. Where does the Stewart vein terminate northerly and southerly, on a line drawn northerly and southerly across that map?

A. I do not understand your question.

Q. You have told us that the Stewart vein has its apex along the line extending westerly from the east end line of the Senator Stewart Fraction claim, have you not? A. Yes, sir.

Q. Now, if there is a termination on any line drawn substantially parallel with the easterly end line of the Senator Stewart Fraction, show us where that line would be.

A. The termination of the Stewart vein on its upward course is in the westerly part thereof against what is known as the Clancy fault. That fault passes through the top of raise—what is marked on Plaintiff's Exhibit 1 as raise 2 W., at about the point marked in pencil W on this map. That same fault is shown in the Apex drift at the point marked "W-2," and the plane of this fault is shown also in the model, marks the termination of the [463—418] vein in its upward course in the westerly or central part of the Senator Stewart Fraction claim. [464—419]

Q. I wish you would take off the top of that model,

(Testimony of Alfred Frank.)

the surface, and point out to the Court if you will, please, what you designate as the apex of the Stewart vein along the Osborn fault.

A. I would have to get a screw-driver to do that.

The COURT.—I can see it very readily without that.

A. On this model I can point out the elevation of the various levels, the 400 or the Fir tunnel level is shown about where I hold my pointer here, and the 300 is shown by this working where I now hold my pointer, the 200 is shown about there and the 100 right about there at the present position of my pointer. The lower Stewart tunnel is there, and the apex working or the Apex drifts are probably better to be seen from this side. The portion of the glass section that is cut off is intended to represent the surface in this part of the model; the Apex drift workings are about in there, and this little working in here.

The COURT.—I understand. The light blue lines represent the Clancy fault?

A. Yes, sir. Beginning now, taking the plan map and using the plan map in conjunction with the model, I can [465—420] first trace the apex through its course in the center of the Stewart Fraction claim on the plan map, and then show it on the model; I think that would probably be the best way that I can do it.

Mr. GUNN.—Q. Yes, if you will do it that way.

A. We have the apex of the Stewart vein disclosed in the northerly end of the Apex drift at about the

(Testimony of Alfred Frank.)

point marked "W. 1." At that point it intersects—well, it does not exactly intersect but it comes into intersection with, and lies on the Osborn fault. The same is true of the old lower Stewart tunnel level at a point near survey station 2512. The same on the 100 and in the raise connecting the 100 foot level with the lower Stewart tunnel level; then on the 200 level a short distance from the bottom of raise marked 218 east, and on the 300 level near survey point 2569. Taking this same section of the apex as shown on the model, we have it first in the extreme easterly end of the Apex drift just about where I am holding my pointer, and from there on it extends in a downward course on the Osborn fault at about the inclination of the pointer as I hold it, and is shown by this representation on the successive sheets of glass between this point and the point [466—421] where the easterly end of the drift is shown. The apex westerly from the point at which I started, that is the first disclosure of the Osborn fault in the Apex drift, and we have the vein or a portion thereof shown in and on the Apex drift, the real apex of the vein being a short distance above the elevation of this drift. At the westerly part of the Apex drift near point W. 2 the Clancy fault is encountered and the vein has its apex under the Clancy fault as shown by the section against which I have my pointer, right there. That particular section is the fifth sheet from the westerly end of this model; going from there to the extreme west end of this model the vein is shown as against the Clancy fault on the various sec-

(Testimony of Alfred Frank.)

tions there. On this map, Exhibit 1, the vein is disclosed as having its apex against the Clancy fault at the top of the raise W. 2, and at various points in the stopes above the Stewart lower tunnel level where these have been extended to an intersection with the Clancy fault.

Q. Now, directing your attention again to the model for a moment and that part which purports to represent the Osborn fault, I will ask you whether or not they are workings [467—422] that disclose that fault and its location to the extent shown upon the model, or whether there are subprojections of the fault in making that model.

A. There naturally have to be a number of projections. The strike or course of the fault as shown in the lower part of this model is that taken as fixed by the fault as located on the Fir tunnel level where the same first cuts the fault, particularly at the point in drift 405 east, and the small branch extending out there from which raise 415 east is raised. The Osborn fault is shown in this working, and again in what is marked on this map as 400 north crosscut. The Osborn fault is shown at the extreme end of this crosscut, and that fixes the strike or course of the Osborn fault which has been used in painting the same on the various sections of this model; that is, that fixes the strike which has been used in the lower portions of this model. On the upper portions we have taken the intersections of the various planes represented by the sheets of glass in the model, with the intersections of the Osborn fault as actually dis-

(Testimony of Alfred Frank.)

closed in the workings on the 300 foot level, on the 200 foot level, on the 100 foot level and on the old lower Stewart tunnel level, and on the Apex [468—423] drift level, these being in or near the extreme easterly end of these various levels.

Q. Now, I notice that the sections in this model are not on lines or planes parallel with the easterly end line of the Senator Stewart Fraction claim. Why were those sections produced at an angle instead of on lines parallel, if you know?

A. The base or general outline of the model was taken at or nearly parallel to the side lines of the Senator Stewart Fraction claim. The planes of section were taken at or nearly at right angles to the course of the Osborn fault as shown on the 400 or Fir tunnel level, and were so taken because at that angle they more nearly cut the apex at right angles than at any other one position which we found it possible to take the section in.

Q. I want to call your attention here for a moment to these cross-sections. The first is Plaintiff's Exhibit No. 8. Point out on the plan map the lines through which that cross-section was taken, which is cross-section 6.

A. That cross-section six was taken on a line parallel to the easterly end line of the Senator Stewart Fraction claim, and is marked on Plaintiff's Exhibit 1 as section line six. [469—424]

Q. What is the angle of declination as the vein departs from the apex as shown by this cross-section?

A. The angle is about 45 degrees. It is shown on

(Testimony of Alfred Frank.)

this cross-section at about 40 degrees.

Q. And that was taken along the hanging-wall?

A. Well, the hanging-wall is shown flatter, and the footwall is shown steeper than that. The hanging-wall is shown at a dip of about 35 degrees and the departure of the footwall shows a dip of about 40 degrees.

Q. The average dip would be about what?

A. The average dip of that section of the vein would be about half way between.

Q. For what distance downward is approximately that dip maintained?

A. That dip is maintained from the 200 level—from a short distance above the 200 level downward for about 60 feet in vertical depth, and then the vein becomes flatter, that is, the vein on the plane of that cross-section becomes flatter.

Q. I will ask you to give me the declination or downward course of the vein from the apex as shown by this cross-section 4, which is also Plaintiff's Exhibit 4, as it leaves [470—425] apex.

A. The hanging-wall of the vein as it leaves the apex as shown on the plane of this section, has a dip downward of about 43 degrees.

Q. And for what distance does it maintain approximately that dip?

A. For a distance of about 135 feet.

Q. I will ask you to give us the same information with reference to cross-section No. 5, Plaintiff's Exhibit 9, that you just gave with reference to that cross-section.

(Testimony of Alfred Frank.)

A. The vein as it extends downward from the apex on the plane of this cross-section has a dip of about 42 degrees, which is maintained on the plane of this section for a distance of about 250 feet on the slope of the vein.

Cross-examination.

(By Mr. GRAY.)

Q. With reference to the east end line of the Senator Stewart Fraction, the sections are taken at an angle diverging from the course of that line, aren't they?

A. The sections are taken at an angle diverging in a [471—426] southerly direction from the course of that line. I think the angle is about 15 degrees.

Q. What is the course of the sections?

A. Well, if I remember correctly, the course of the east end line of the Senator Stewart Fraction is about south 24, west, and the course of the planes of sections used in the construction of this model were made at about 15 degrees to the south; in other words—

Mr. FOLSOM.—You mean east, do you not?

A. Well, to the east or south, either one, so that the course of these planes is about south 9, west.

Q. Are they all exactly parallel, the sections?

A. Yes.

Q. And south 9, west?

A. I think that is approximately the course; it might vary from that by a degree or so, but not more than that.

Mr. GRAY.—I suggested to Mr. Gunn, your Honor, that I would like to reserve examination of

(Testimony of Alfred Frank.)

this witness upon the model until I have had an opportunity to see the cross-sections and also the map showing the lines of section, and it will very materially assist us in proceeding and perhaps materially shorten the examination if those can be furnished [472—427] to us during the afternoon so that we can look them over this evening. These sections we cannot get out of the model. Is that satisfactory, Mr. Gunn?

Mr. GUNN.—Yes, I think we have them and we will be glad to show them to you.

Mr. GRAY.—I would like to postpone the further examination of Mr. Frank until I have seen them.

Mr. GUNN.—Can't you examine him on other matters?

Mr. GRAY.—I don't think there is anything else particularly that I want to examine him on.

The COURT.—Very well. The witness may be withdrawn, and may be recalled for further cross-examination.

Witness temporarily excused. [473—428]

[Testimony of George A. Kennedy for Plaintiff.]

GEORGE A. KENNEDY, after being duly sworn as a witness for plaintiff, testified as follows:

Direct Examination.

(By Mr. GUNN.)

Q. Where do you reside, Mr. Kennedy?

A. In Denver, Colorado.

Q. You are a mining engineer by profession?

A. Yes, sir.

(Testimony of George A. Kennedy.)

Q. And are you a graduate of any school?

A. I am a graduate of the Colorado School of Mines in the year 1895, at which time I received the degree of Engineer of Mines.

Q. And what experience have you had in your profession since your graduation?

A. For possibly the first two years after leaving school I had an office, an engineering office in Colorado, in Rico and Silverton, after which I served in various capacities, from assayer to surveyor, to engineer to assistant to the manager for the Tiger Mining Company, the Iowa Gold Mining Company, of Silverton; after which [474—429] I served in various capacities in the mining profession for a portion of a year, and then was engaged for several years as the examining engineer for the Venture Corporation, and have been in the examination of mines as an independent engineer ever since that time, continuously.

Q. And over what section of the country has your experience taken you?

A. It has taken me over most of the western States, including South Dakota, Montana, Idaho, Colorado, New Mexico, Arizona, and in Canada, Alaska and Mexico.

Q. Are you acquainted with the property in controversy in this action? A. I am.

Q. Have you made an examination of that property with a view to obtaining knowledge and information to enable you to testify as a witness in this case? A. Yes, sir.

(Testimony of George A. Kennedy.)

Q. And when did you first become acquainted with this property?

A. During February, March and a portion of April, in 1912, I made an examination of the Stewart mine for the purpose of estimating the ore bodies then developed, at [475—430] which time I sampled and measured the exposed ore bodies, and reported thereon.

Q. Do you recognize the workings in that property as they are depicted on Plaintiff's Exhibit 1?

A. Yes, sir.

Q. And what part of the workings as shown on that map have come within your observation in the examination that you have made?

A. A portion of the workings depicted upon Plaintiff's Exhibit 1 have been done and platted since my examination last year. Those portions are—do you wish that I should point them out?

Q. I wish you would, yes.

A. The drift shown at this point, marked "Apex Drift" I believe has been driven, if not altogether, in part at least since that time. The raise connecting the old Stewart tunnel level, in the eastern end, marked "Raise No. 218 East," I believe has also been done since that time, as well as raise No. 314 east, and some of the work on the main tunnel level, notably the crosscut shown at this point, which has no designation, but runs from survey point No. 2100 to survey point 2046, and the drift marked "Drift No. [476—431] 415 West" from survey point 2046; also the working marked 400 north crosscut

(Testimony of George A. Kennedy.)

and 409 crosscut, have been run, and a short drift from survey point 2513 to 2537, and the raise therefrom, marked raise 415 east, and the short drift to the east from the top of that raise. In addition to that, the 200 foot level has been extended—I beg your pardon, it has not, but the 300 foot level has been extended a short distance beyond the face at that time, in the drift marked 305 west, I believe, and near survey point 2113, from that point to the present southwesterly face. Also drift running southwesterly from what is called west 313 crosscut from near survey point 2567 to the present face. I believe that is all of the levels. In addition to that, raise No. 314 west has been carried through to the connection with the 200 foot levels, and raise No. 223 west has also been put through, and raise No. 228 west has been finished. I believe that is all.

Q. Have you made an examination of those workings which you have just detailed within the last few days, so as to determine what they disclose and enable you to testify regarding the same?

A. Yes, sir. [477—432]

Q. Now, has the examination that you have made of this property extended to the workings in the westerly portion of the property or beyond the line drawn at right angles to the southerly line of the Senator Stewart Fraction claim at the top of raise marked raise No. 2?

A. My examination of that ground was merely cursory. I was not interested in that particular portion at the time and I did not do anything except to

(Testimony of George A. Kennedy.)

go through them and look at them casually.

Q. Have you visited the workings and ore bodies beneath the surface of the Ontario claim?

A. I have been to the connections made on the 300 foot level and the 200 foot level with the top of their stopes, but I have not gone down to their levels.

Q. From the examinations that you have made, have you been able to determine how many veins are disclosed in these workings easterly of the line drawn through the top of raise No. 2 west, to which I have just called your attention?

A. Yes, sir.

Q. State, if you will, please, how many veins are disclosed in those workings easterly of that line.

[478—433]

A. As I remember it, there were two veins disclosed in that portion of the property, one of which at the time I considered very minor and unimportant, and did not spend much time upon it; and that was shown in a drift at the north end of what is called No. 200 north crosscut. This drift extends easterly and westerly from that point; for a short distance from there there is what appears to be a vein. In addition to that I find in this portion of the ground a vein which is known as the Stewart vein.

Q. And on what vein are the ore bodies in the Ontario, if you have been able to determine?

A. The ore bodies as shown to exist in the Ontario from my observations in the stopes at the connec-

(Testimony of George A. Kennedy.)

tions, are a continuation of and a part of the Stewart vein.

Q. And speaking with reference to the vein in the easterly portion of the Senator Stewart Fraction claim, state whether or not the ore bodies in the Ontario are a part of the same vein as the ore bodies found in that section of the Senator Stewart Fraction claim. A. They are, yes, sir.

Q. How do you determine that?

A. By following the workings upon the Senator Stewart Fraction upon the Stewart vein and ore body along through [479—434] various drifts and through the stopes, through raises, across the Senator Stewart claim and the Lazy Jean, we find the ore body continuous, that is, the merchantable ore body is continuous, with minor narrowings and faultings, directly into the ore bodies shown in the Ontario claim.

Q. Both the Frank and the Gray ore bodies?

A. Both of them, yes.

Q. State whether or not any part of the apex of this vein is to be found in the Senator Stewart Fraction claim, and if so, where is it located.

A. The apex of the Stewart vein has been disclosed in the Senator Stewart Fraction at various places from a short distance of the easterly end line of the Senator Stewart Fraction claim along nearly through the central portion of this claim to the westward, and slightly northward, thence westerly and southerly across the south side line of the Senator Stewart Fraction claim, and on still further.

(Testimony of George A. Kennedy.)

Q. How did you determine that line that you have followed to be the apex of this ore body?

A. The workings and the stopes of the Stewart mine which have been opened in the process of extracting the ore have followed this ore until they have come to a point where it is the highest point throughout, and they do not [480—435] find any ore further; that is the limit of the ore.

Q. From the examination and observations you have made are you able to say whether or not the plane drawn through the apex of this vein as you have observed it in the ground is higher or lower than the plane of the ore bodies that are found in the Ontario ground?

A. What kind of plane, please?

Q. Well, at any point along the apex.

A. A horizontal plane?

Q. Yes.

A. Yes, at any point throughout this apex the vein takes a downward course in any direction and in a direction downward to the south and to the east, and is higher than the ore body shown in the Ontario.

Q. What, if any, structural difference is there in the vein as you find it disclosed along the line of this apex in the Senator Stewart Fraction claim and the vein as it is found in other parts of these workings?

A. The structural features of the vein vary slightly in different places of the ore body; some places they have been crushed and brecciated, and

(Testimony of George A. Kennedy.)

the structural features more or less destroyed by the crushing, and these features [481—436] are found at various places throughout. The general character of the ore body and the vein throughout along its apex is the same as found elsewhere throughout the ore body, and at the point in the stopes where the Stewart ore body or the Stewart levels go into the stopes of the Ontario.

Cross-examination.

(By Mr. FOLSOM.)

Q. Mr. Kennedy, what terminates the Stewart vein to the south?

A. I don't know that the Stewart vein is terminated to the south.

Q. Why do the workings stop?

A. At what point particularly?

Q. Well, all along the workings all stop before they get to the south side line?

A. You mean here?

Q. Yes, at that end, against that fault?

A. Oh. On these various levels, as far as I know, the marketable ore or the ore that would pay to stope in the vein pinched down and there was no more ore there as far as I know. [482—437]

Q. Is there a fault disclosed at that point?

A. As far as I know there is no fault here. I did not investigate to see that.

Q. I understand you to say that you have not been in the Ontario, but that you had simply gone to the top of the stopes? A. Yes, that is correct.

(Testimony of George A. Kennedy.)

Q. What is the general course of the north and south portion of the apex of the Stewart vein as you have described it, that is to say, along the Clancy fault?

A. Why, the general course is a little bit east of north.

Q. Did you make an observation?

A. I would have to put a protractor on to tell you the exact course.

Q. Do you think that the observation that was made by Mr. Clancy the other day was correct, as far as you know?

A. As to the direction, yes, sir.

Q. What is the general course of the ore bodies in the Ontario which you observed in the stopes, the Frank and the Gray; you said you saw the top?

A. Yes. They were approximately in the same general direction as the apex depicted above here.
[483—438]

Q. And they dip, of course, at right angles to the course? A. Yes, at right angles.

Q. What was the general course of the Osborn fault from the east end line to the point where the vein began to bend?

A. The general course is approximately north 65 to 70 west.

Q. What is the dip of the *of the* upper edge against the Osborn fault that you refer to and that you describe as the apex from the point marked W. prime on Exhibit No. 1, to the point where it crosses the east end line of the Stewart Fraction?

(Testimony of George A. Kennedy.)

A. You mean the inclination?

Q. What is the inclination of the edge?

A. Well, I am not able to give that offhand. I would have to get the difference in elevation of this drift down there and figure it for you.

Q. Would it take you long?

A. I don't think so. I would like to have that.
(Witness figures.)

Q. What is the figure? [484—439]

A. The angle of inclination of the apex from the point in the Apex drift marked "W" to the point on the 300 foot level marked "Drift 305 East" at its crossing with the easterly end line of the Senator Stewart Fraction is approximately 31 degrees.

Q. Is that the highest point that you recall, the point which you took above the Apex drift?

A. Yes, that is near the surface, very close to it.

Q. What is the general direction of the dip of the portion of the vein, the north and south portion of the vein; you said that was southeasterly in the same direction as the ore in the Ontario?

A. The dip—no, I don't think I said that. The course—

Q. The inclination, I said.

A. The inclination, yes.

Q. What was the vertical distance between the point that you took up there above the Apex drift and the point beneath the east end line?

A. 356 feet.

Q. And what was the horizontal distance?

(Testimony of George A. Kennedy.)

A. About 500 feet. That is only approximate, of course.

Q. Is that portion of the apex, the north and south [485—440] portion of the apex practically horizontal?

A. No, I think there is a slight inclination.

Q. In which direction?

A. In a southerly direction, if I remember correctly.

Q. Is the bending of the vein or the breaking of the vein in the vicinity of the Osborn fault due to that fault in your opinion?

A. It is my opinion that the strata adjacent to the so-called Osborn fault was bent by the action of the Osborn fault in all probability.

Mr. FOLSOM.—That is all.

Mr. DINES.—That is all.

Witness excused. [486—441]

[Testimony of Walter G. Swart for Plaintiff.]

WALTER G. SWART, called as a witness on behalf of the plaintiff, being first duly sworn, testified as follows:

Direct Examination.

(By Mr. DINES.)

Q. State your full name.

A. Walter G. Swart.

Q. Your residence. A. Denver, Colorado.

Q. Your occupation. A. Mining engineer.

Q. How long have you followed the occupation of mining engineer? A. Between 22 and 23 years.

(Testimony of Walter G. Swart.)

Q. Did you attend any technical schools preparatory for that purpose?

A. I did, yes, but I did not take my degrees. You wish me to explain that?

Q. Yes, sir, if you please, where you went?

A. I studied it first with my father who was a civil engineer; he was chief engineer of the New York State [487—442] Lines of the Lehigh Valley Railroad; I was running a transit when I was sixteen years old. I did my high school work in two years and a half, and I went to Cornell University and attempted to keep up the same pace and my health failed and I had to go to Colorado. After two years in the open I went back into the Denver University. There I took practically all the mathematics that would have given me my degree but I was deficient in some of the other work, so I have had something more than my junior year.

Q. And since that time where have you followed your profession?

A. Do you want me to go into detail on that?

Q. Yes, sir, in a general way tell where you were residing, what companies you have been connected with and what ones you are connected with now?

A. I went from the Denver University to the Arkansas Valley Smelting Company in Leadville. From that I went into mining work for Mr. August R. Meyer who was at that time the head of the Arkansas Valley Smelting Company. Later I went to Aspen, Colorado, and later to Cripple Creek and to the San Juan country, being associated with

(Testimony of Walter G. Swart.)

[488—443] various mining companies in various capacities, from manager down. I was associated with Mr. Robert M. Thompson of the International Nickel Company, doing mining work, and for the last several years I have been western manager and consulting engineer for the American Zinc, Lead & Smelting Company, one of the largest concerns in the production of zinc and lead in the United States, with headquarters at Boston. My headquarters are in Denver.

Q. What States and territories and in what mining communities or districts have your duties led you into?

A. I have made mine examinations in all of the western States and also in the States through the Mississippi Valley in some of the eastern States, Tennessee for example. I have conducted mining operations in most of the western States.

Q. Has your seven years' connection with the company that you are now with led you particularly to investigate lead and zinc deposits? A. Yes, sir.

Q. Does your company do business up in this western country, through the northwest, in Idaho, the Wardner district? [489—444] A. Yes, sir.

Q. In that connection did you make any examination of the workings of the Stewart Mining Company indicated on Exhibit No. 1 of the plaintiff?

A. I did.

Q. When did you first examine that property?

A. In March of 1912.

(Testimony of Walter G. Swart.)

Q. To what extent did you examine it at that time?

A. We examined the lower workings rather carefully, the upper workings being pretty well exhausted of their marketable ore were not considered of so much importance and we gave very little attention to them.

Q. Now, since that time, have you made any examination for the purpose of preparing yourself to give evidence in this case? A. Yes, sir.

Q. Now, what was the extent of that examination that you made?

A. I went through the workings which had been made since I was here in March, both the workings in the lower levels for the further exploration, development and extraction of ore, and the workings which had been run to [490—445] show the apex of this ore body and this vein.

Q. Did you examine the different portions of the vein on this last occasion including the upper termination of the vein at its highest point in the lines of the Senator Stewart Fraction claim?

A. Yes, sir.

Q. Now, please in detail give to the Court the examination that you made as you made it, what you found and the conclusions that you came to and the reason for those conclusions, using any of these exhibits that are in evidence, and call attention, please, to the particular exhibit.

A. On Exhibit 1, we went first into the crosscut leading to what is known as the Apex drift. We

(Testimony of Walter G. Swart.)

examined the west drift which is marked here "W-2," and which shows the top of what is known as the Stewart vein and also shows what is known as the Clancy fault. We went into the east Apex drift which is here marked "W-1" or "W-prime," there finding what is known as the Osborne fault, also the top of what is called the Stewart vein. Coming then back to the raise which is here marked raise 4 east we went down through the raise to the tunnel level [491—446] the old Stewart tunnel level. Crossing around and through the old stopes we next went through east No. 3 crosscut to the east end of drift 5 east at a point where it is approximately cut by the line representing the cross-section No. 5. Here the Osborne fault is again in evidence, also the Stewart vein, coming against the fault. Continuing, we next went down raise marked 218 E. passed the 100 level, which is shown at this point by old stopes and the remains of the track which was in the level. Reaching eventually the 200 foot level near the point where it is intersected by the plane marked by the cross-section lines VI-VI. Continuing then eastwardly along the 200 foot level to the top of raise 314 E. and down that raise to the 300 level. The portion of the 200 level east of raise 218 E. is partly upon the fault and partly upon the vein. The same is true of raise 314 E. Raise 314 E. near its bottom comes into the top of the stopes which were above the 300 level. Going easterly in those stopes we come to the end of this level where the Osborne fault and the Stewart vein—the Osborne fault is dis-

(Testimony of Walter G. Swart.)

closed. Coming back southwesterly along the 300 level we went down raise 410 E. to the 400 level or Fir tunnel level. Practically all of [492—447] this distance with a few minor exceptions is in the Stewart vein.

Q. Did you examine at this time the ore bodies in the Ontario lode mining claims in dispute here?

A. Yes, sir. I say "yes, sir," we went simply over the backs of the stopes in order to determine the continuity of the ore from one claim into the other.

Q. What conclusion did you come to as to the continuity of the ore from the Stewart vein into the Ontario?

A. That it was continuous, that it was in the same vein, that it was the same ore body.

Q. What character of a vein is the Stewart vein?

A. I should say it was a replacement vein.

Q. Do replacement veins usually have well defined parallel walls and regular dip or walls running at various angles and not parallel to each other in dip?

A. Well, as a rule replacement veins will be irregular. It is quite apt to be the case that one wall is more sharply defined than the other.

Q. And how is the deposition made of the ores in replacement veins? Are you familiar with that branch?

A. Why, I naturally had a good deal to do with it; [493—448] I don't know that I understand exactly your question however.

Q. Well, is there any reaction involved in the action of the ores in what are known as replacement

(Testimony of Walter G. Swart.)

veins that is dissimilar from the method of the deposition of the ores in ordinary fissure veins?

A. I cannot say that there is, that there is any chemical difference as to the action of the chemical solutions.

Q. What do you mean by replacement?

A. I mean that a portion of the rock material which has been most readily soluble in the solutions carrying the mineral has been dissolved and has been replaced by the mineral which the solution originally carried.

Q. Does it usually require any greater length of time for the reaction to take place involved in the taking up of the matter that is afterward replaced with mineral in solution in getting ready for the replacement than in the ordinary reaction involved in the formation of ores in fissure veins?

A. I do not know that I can answer that yes or no. I do not know that anyone could answer that, the prime element [494—449] with regard to any chemical reaction under such circumstances.

Q. In the Stewart vein do you find a regular dip to the vein or a dip that varies?

A. A dip that varies.

Q. At different portions?

A. It varies in different portions.

Q. In what portions of the mine did you find the greatest variation in the dip of the vein?

A. The area which lies between the east No. 3 crosscut, the drift 5 west, the drift 5 east, and the drift 4 west in its northeasterly portion has a dip

(Testimony of Walter G. Swart.)

that is very flat, has no dip at all perhaps, lies flat; the vein in some cases has a reverse dip. As against that there are places in the mine where the dip will rise forty-five degrees and perhaps steeper.

Q. Were you able to discover in the ground evidences of the cause of those changes in dip?

A. Yes, sir; I think it would be fair to say we did.

Q. What did you find there that would account for those changes?

A. One cause would be what is known as the Osborne [495—450] fault.

Q. What is the strike of the Osborne fault?

A. Approximately north 75 west.

Q. In what way does the apex or top of the vein in the Senator Stewart Fraction come against this fault; is it above the fault or under it?

A. It is above it.

Q. Where did you find the Clancy fault disclosed?

A. In the point in the Apex drift marked "W-2," at the top of raise 2 W. which is marked "W."

Q. On Exhibit 1?

A. On Exhibit 1, yes, all of this is on Exhibit 1; and at the top of raise No. 7.

Q. Did you see at any point where the Stewart vein on its upward course from the lower workings came in contact with or lay against the Clancy fault?

A. Yes, sir; in those three places I have just named.

Q. Is that the apex, one of the points of apex, that you have already named as the apex here?

A. It is.

(Testimony of Walter G. Swart.)

Q. Does that lie under or above the fault? [496—451]

A. Under the fault.

Q. Are there any workings there that would indicate whether or not upon the other side of the fault any vein can be traced that can be identified as the Stewart vein?

A. I am not at all familiar with the workings which lie to the west of the Clancy fault. We were not interested in those during our examination. We were told that the workings were more or less inaccessible at the present time so we did not go up there.

Q. For the purpose of illustration, I would ask you to examine these small blue lines in the model here, the smaller blue lines in the model that is designated Exhibit 15, and state whether or not as to that particular feature of the model it serves to illustrate the way the Stewart vein at the points where it lies under the Clancy fault comes in contact with it.

A. Yes, sir, I should say roughly that it does.

Q. Did you see any evidence of it going beyond it?

A. Not at those three places, no, sir.

Q. How did the Clancy fault look; what do you mean by the Clancy fault? Describe it to us if you please.

A. The Clancy fault as disclosed in those three [497—452] places is perhaps better described as a brecciated zone than as a fault plane. That is to say, there is a considerable area of the country rock which has been shattered and broken and the dis-

(Testimony of Walter G. Swart.)

tinct line of movement of the fault is not so well developed. It is perhaps a little difficult to put your pick upon it at any given point and say, "here was the last plane of movement."

Q. What causes the brecciation that you have named, the grinding of the particles of material?

A. In all probability the movement of one side of the fault upon the other.

Q. Is that a movement that is accomplished by a sudden movement and extending over a great extent in faults, or is it one extending over a long period of time?

A. In all probability over a very long period with a very gradual movement, perhaps intermittent.

Q. After this breccia is formed by the grinding together of the fault action, what effect does it have upon the solutions from which the deposition of ore is made?

A. I do not know that I can say;—I do not know that I can tell you positively that it would have one [498—453] effect or the other. In some cases the brecciation, the crushing of the rock into small fragments furnishes a channel or channels for the solutions and it is only in such regions that you find ore deposit. Again, in other parts of the country, in other mines, you will find that the brecciated zone apparently gave too free a channel for the solutions and they went through perhaps too fast, having too much of a channel without enough of a damming back, and that no deposition took place.

Q. You speak of damming back. Does a mass of

(Testimony of Walter G. Swart.)

finely ground material compactly put together there by compressive forces act as a dam to a solution.

A. It may do so, yes.

Mr. GRAY.—I object; I do not see what this has got to do with the issues of this case.

Mr. DINES.—It may have a great deal to do with it; that is a question.

The COURT.—The objection will be overruled.

Mr. DINES.—Q. Where you found the Clancy fault and this vein running against it, did you find a condition of finely ground material there opposing the passage, that would have the effect of opposing a passage, so far as you [499—454] could determine it, of any solutions that would carry mineral beyond it?

A. There is a gouge there; whether it continues and whether it would form a dam or not, I could not say.

Q. It is difficult to determine after these number of years? A. It is, yes, sir.

Q. Was the vein as it lay against the Clancy fault well defined or broken?

A. A few feet below the Clancy fault are the old stopes where the vein was very clearly defined. As I said a few moments ago the very top of the vein is in a faulted region, a faulted zone, and it is difficult to determine where the vein stops and the fault begins.

Q. Was there any other similarity between the character of the vein as it lay against the Clancy fault and the character of the vein as it lay against

(Testimony of Walter G. Swart.)

the Osborne fault?

A. No, they are dissimilar.

Q. Where did you find from the observations you made the line of apex within this claim?

A. Referring to Plaintiff's Exhibit 3, this represents as nearly as I personally can determine from my [500—455] own investigations the apex of this vein.

Q. Do you think the development was sufficient there to enable you to project the apex in that form within the boundaries of the claim?

A. The portion of the apex beginning at the southeast end line of the Senator Stewart Fraction to the point in the Apex drift at the top of the bend where the red line makes the large bend, is very well developed. This portion from the top of the arch as represented here to the south side line of the Senator Stewart Fraction, while it has been well developed, I could see the vein in but two places—the top of the vein or the fault—one here at the south side line of the Senator Stewart Fraction, and the other in the Apex drift.

Q. Now, are there more points of actually developed, I mean physically developed points of apex in the northerly-southerly portion of the vein, or in the easterly-westerly portion?

A. The points that I could see that are accessible show more in the section from the top of the large bend to the southeast end line of the Senator Stewart Fraction.

Q. What data do you use when you have certain

(Testimony of Walter G. Swart.)

apex [501—456] points that are actually opened up covering a claimed line of apex, what other data do you use in determining the intermediate points?

A. You mean in this particular case?

Q. Yes, sir, in this particular case.

A. My understanding is that the points that were used in determining this apex here were the top of the Apex drift, the top of No. 2 raise, and the intermediate stopping points between.

Q. Yes; and how is it in the other portion of the apex running easterly and westerly?

A. The other portion of the apex of the vein running from the top of the bend to the southeast end line of the Senator Stewart Fraction is developed with a fair degree of continuity.

Q. Please state to the Court in going from the points of apex as outlined within the boundaries of the Senator Stewart Fraction claim what course you pursue in going to the ore bodies in the body of the Stewart workings and the ore bodies in the Ontario?

A. Do I understand that you want me to start—

Q. No, just say what course. [502—457]

A. What course?

Q. Yes, sir. A. A downwardly course.

Q. Do the ore bodies in the Ontario lie between vertical planes projected in one instance through the easterly end line of the Senator Stewart Fraction and in the other instance through a plane parallel to the end line vertical plane projected through the points where the apex in its southerly point crosses

(Testimony of Walter G. Swart.)

the south side line of the Senator Stewart Fraction claim?

A. Having seen only the backs of two of the stopes of the Ontario ore bodies, I cannot, of my own knowledge, answer that question.

Q. Well, but from the exhibits?

A. From the exhibits, yes, sir.

Mr. DINES.—That is all.

Cross-examination.

(By Mr. GRAY.)

Q. Mr. Swart, did you examine the so-called apex of the vein in the Clancy fault on southerly across the Senator Stewart claim? [503—458]

A. Except in those three places that I named I did not see it.

Q. What three were they?

A. The Apex drift, the top of raise 2 W. and the top of raise 7, I think that is No. 7 raise.

Q. No. 7 raise?

Q. Yes, No. 7 raise comes up here from this No. 4 lateral and then turns and comes up here.

Q. The vein is continuing on its course southerly at the last point at which you do find the vein in the old lower Stewart tunnel, is it?

A. Yes, sir, I think so, southwesterly.

Q. Yes, sir; and you have followed that vein from the Deering crosscut along the Stewart tunnel level?

A. No, sir; that is not possible. Those are the old stopes through there, and they are not now accessible; you have to go around.

(Testimony of Walter G. Swart.)

Q. It is closed up, is it, so that you cannot get through the Stewart tunnel level?

A. It is closed up so you cannot get through the Stewart tunnel level, yes, sir.

Q. Between the Deering crosscut and the southern workings? You say that the Clancy fault has not a well [504—459] defined gouge.

A. No, I do not think I said that.

Q. What did you mean?

A. I said that the Clancy fault shows a more broken condition or shows a broken condition of the rocks on either side of it, a very broken, shattered condition.

Q. Of the rocks on either side of it?

A. Yes, sir.

Q. On the eastern side of it for how far; in other words, below the line of the fault?

A. I think I have already testified that it is rather difficult to determine exactly where the line of that is.

Q. Well, you saw this well defined gouge, did you not? A. I saw a gouge in several places.

Q. Wherever you saw the fault you saw it, didn't you?

A. I saw it outside of a single plane; there is more than one plane of movement there.

Q. Well, tell me now where did you see it.

A. I saw it in the top of this crosscut there—this raise No. 7; I saw it in the top of raise 2 W.

Q. In other words, wherever you saw what you call [505—460] the Clancy fault you saw this well defined seam of gouge?

(Testimony of Walter G. Swart.)

A. No, I think not, not a single seam.

Q. Isn't it a fact, that that fault is as well defined—shows as well defined a seam of talc and gouge as any fault that you observed in and about that property? A. I should say no.

Q. What was the extent of the crushed and broken condition at the Clancy fault so far as your observations went? A. I should say fifteen feet.

Q. Fifteen feet in width? A. Yes, sir.

Q. That would be at right angles to the—

A. That would be at right angles to the fault plane.

Q. To the fault plane. Did you follow that Clancy fault to the north from the Deering crosscut; I mean north of the Deering crosscut any place?

A. No, sir.

Q. Was it disclosed in any of the workings that you call the apex here?

A. Yes, sir; the Clancy fault is disclosed in the [506—461] west end or west drift or the west end of the Apex drift.

Q. Yes, sir. And where does it terminate?

A. I cannot say that to a certainty. There is close to this entering the tunnel here an arch which may perhaps be the top of that fault, but that country is close to the surface and it is rather difficult to say on a short examination whether that is the top or not.

Q. Do you find it is older or younger than the Osborne fault? A. I do not know.

Q. You do not pretend to testify here—

A. I do not pretend to testify to that, no, sir.

Q. And you have nothing upon which you could

(Testimony of Walter G. Swart.)

base an opinion? A. No, sir.

Q. In all of your investigations or examination of the property? A. I have not.

Q. You do not desire to be understood as testifying— A. No, sir.

Q. That it is older than the Osborne fault, do you?

A. I do not know. [507—462]

Q. You do not intend to be understood as testifying that it is older than what you call the Stewart vein? A. No, sir.

Q. And on that you have no opinion?

A. I could not have an opinion without making a careful study of it.

Q. That is a normal fault so far as your investigation went?

A. So far as I know, I have no knowledge of that.

Q. Well, but that would be your opinion from what you saw? A. Yes, sir; I would think so.

Q. What you have referred to here as the apex, from what you call the Apex drift to the east end line of the Senator Stewart Fraction line, is simply the termination of the vein against the Osborne fault?

A. Yes, sir.

Q. Is it your judgment that that fault has affected the vein for some distance in a southerly direction from the fault? A. Yes, sir.

Q. For how far in your judgment? [508—463]

A. I think that is an irregular distance; in some places it might be a few feet, and in some places it might be several hundred.

Q. Are you able to show me where in your judg-

(Testimony of Walter G. Swart.)

ment it was several hundred feet?

A. I think, for instance, here on section five, Plaintiff's Exhibit 9, there is a turning there of at least 200 feet.

Q. And you think the vein was affected for two hundred feet from the line of the fault there, do you?

A. I presume so, yes, sir.

Q. I just wanted your judgment. Where was it that it was only affected a few feet.

A. I do not know that I can tell you directly, but it is—I do not know, I do not think I could tell you without my notes.

Q. Well, have you got them?

A. I have not them with me.

Q. Didn't you bring your notebook up with you?

A. I did not.

Mr. DINES.—Mr. Swart did not know he was to be introduced this afternoon. [509—464]

Mr. GRAY.—All right.

Q. Now, after you leave the influence of that fault, what is the course of the Stewart vein?

A. Generally it has a southwesterly course.

Q. South what, south thirty?

A. Yes, sir, south thirty west.

Q. The direction of the dip would then be south sixty east? A. South sixty east.

Q. You find after you leave the influence of the fault that the vein has a fairly uniform dip, has it?

A. No, sir; it has an irregular dip.

Q. It has an irregular dip; after you leave the influence of that fault, however, you find that its gen-

(Testimony of Walter G. Swart.)

eral is approximately north thirty east?

A. Yes, sir. [510—465]

Q. After you get away from the influence of the fault, while the angle of the dip varies, the direction of the dip is approximately the same, the course of the vein being approximately north 30 east, isn't that true?

A. Yes, I think that would have to be necessarily true, theoretically.

Q. Now, you have observed this fault that is referred to as the No. 11 fault? A. Yes.

Q. That also is a normal fault?

A. I don't think it can be called a normal fault; it is what is known as a twist or rotary fault or a tear; there are a great many different names for it, none of them entirely satisfactory.

Q. What is the inclination and direction of that fault?

A. It varies from 30 to 36 degrees, the dip being to the southwest, I should say, slightly; I have forgotten exactly about that, but my recollection is that the dip varies from 30 to 36 degrees, and the dip is slightly to the west of south. That may not be quite correct. It is in a southerly direction, however..

Q. The hanging-wall went down along that fault, didn't it? [511—466] A. Yes, I think it did.

Q. Then it is a normal fault, isn't it?

A. Yes, No. 11, if the hanging-wall went down it, would be a normal fault.

Q. Look at the section, Mr. Swart; if it is a normal fault explain why it is upon this section that it has

(Testimony of Walter G. Swart.)

been given the appearance of bending downward on top of the fault? A. I could not tell you.

Q. Tell the tunnel level of the Senator Stewart; how far do you find from the Osborn fault that that vein has been affected on its course by the local influence of the fault?

A. Approximately 100 feet, perhaps more. I cannot answer that because I do not know whether this drift is on the vein or not.

Q. By this drift you mean what?

A. The old drift No. 4 east. I don't know whether the drift No. 4 east is against the wall of the vein or not.

Q. It has been testified here that it was all in the vein. There it is.

A. Yes, that would show an influence; that is more a matter of opinion. I have no data except what I see before [512—467] me on this map. If you want my opinion on that, I can tell you, that is all. That would be perhaps 100 or 150 feet.

Q. From where? A. From here to here.

Q. From the Deering crosscut to what point?

A. From a point 25 feet south of the Deering crosscut to a point near survey point 2090. According to this I would have to modify that considerably, because I would have to include all of this entire distance from point 2090 to point 2549, I think the figure is.

Q. You understand that is a broken line and does not represent it accurately?

A. I understand it does not represent it accurately.

(Testimony of Walter G. Swart.)

Redirect Examination.

(By Mr. DINES.)

Q. You were asked about the dip of this vein at different places, and I don't know whether the words "true dip" was used, or regular dip or something of that kind?

Mr. GRAY.—No, it was not.

Mr. DINES.—What was your word?

Mr. GRAY.—Dip. [513—468]

Q. Well, he used another word. Do you recollect what that word was?

Q. I have forgotten the exact language and I cannot quote it. Did you refer in your answer to the question regarding the dip to what is known as the true dip, generally at right angles to the strike?

A. I cannot remember just what the connection was.

Q. What do you mean by the dip when you speak of the dip of a vein; how do you usually take it?

A. A line at right angles to the strike at any given point.

Q. Now, you take a line at right angles to the strike at any given point of this vein; please state to the Court whether or not that would represent a continuous and general dip throughout the vein as it goes downward into the earth. A. It would not.

Q. Why not?

A. Because the only case under which that could be true would be that the vein were itself a plane. If the vein becomes a curved surface in any way, then

(Testimony of Walter G. Swart.)

the dip constantly changes from point to point.
[514—469]

Q. Then when you measure a dip of a constantly changing vein or a vein that is irregular in dip, you do not think that that is a fair dip to take its local dip taken at that particular place as a representative of the general dip of the vein throughout its course from apex to bottom? A. It is not.

Recross-examination.

(By Mr. GRAY.)

Q. In other words, you think that in determining the course or the dip of a vein you should cast aside local dips and local courses and take the general course of your vein?

A. I don't see how, in a curved vein, it is possible to state the dip of the vein in positive terms, because it varies from point to point.

Q. You can state the onward course of the vein, can't you, or the downward course?

A. Yes, you can state the downward course.

Q. And in giving the dip of a vein or the course of a vein it is not proper to take some local course that you find, or some local dip, is it? [515—470]

A. No, sir.

Redirect Examination.

(By Mr. DINES.)

Q. Now, in reference to the downward course, what do you mean by the downward course of a vein from its apex; give us your definition of that; what do you mean by downward course?

A. Starting at the apex of the vein at any given

(Testimony of Walter G. Swart.)

point and moving from that point downward at right angles to the course of the vein where you start.

Q. Suppose that you move from your point of the apex on a plane parallel to the plane of your end lines in this case, would that be a downward course?

A. It would.

Mr. GRAY.—I object to cross-examination of his own witness.

The COURT.—I think it is improper. I will allow the answer to stand, however.

Mr. DINES.—Very well, your Honor.

Witness excused.

Whereupon further hearing was adjourned until January 10th, at 10 A. M. [516—471]

Friday, January 10th, 1913, 10 A. M.

**[Testimony of Alfred Frank for Plaintiff
(Recalled).]**

ALFRED FRANK, recalled on behalf of plaintiff, testified as follows:

Mr. GUNN.—I'll state to counsel that I have another question or two to ask of Mr. Frank.

The COURT.—Very well.

Direct Examination (Resumed).

(By Mr. GUNN.)

Photograph marked Plaintiff's Exhibit No. 16, for Identification.

Q. Mr. Frank, I call your attention here to a photograph marked Plaintiff's Exhibit 16, and ask you by whom that photograph was taken.

A. This photograph was taken by me.

(Testimony of Alfred Frank.)

Q. And if that photograph is a picture or purports to be a picture of any part of the vein involved in this controversy, you may state where the photograph was taken and what it purports to picture.

A. Referring to the plan map, Plaintiff's Exhibit 1, [517—472] on the working which is known as the old lower tunnel level, this photograph represents a condition, and was taken of a condition or exposure existing at a point five feet easterly from survey point 2512. May I put a mark on there?

Q. Mark it, yes. Now, how have you designated the point on the map?

A. I have designated it by an arrow head at a point about five feet easterly from survey point 2512. The camera was pointing in a direction looking north 60 west. As nearly as possible to get it, I endeavored to place the camera in a position pointing directly along the strike of the Osborn fault at that point, but because of the timbers and the impossibility of getting a good focus, were I to have moved the camera more nearly in that direction, I could not quite get it in the correct position there, inasmuch as the Osborne fault has at that point a course as observed by me of north 70 to 75 west, whereas the angle along which this picture was taken was about north 60 west.

Q. State whether or not that picture is a correct representation of the conditions as you have observed them in the ground.

A. This picture is a correct representation and reproduction [518—473] of the conditions as they exist in the ground, and it illustrates the top of the

(Testimony of Alfred Frank.)

ore body in the position that it occupies on the Osborne fault. The same material, of course, extends higher than the top of this photograph, but the top of this photograph is practically at the top of the high grade ore.

Mr. GUNN.—We offer the picture in evidence.

Photograph admitted in evidence as Plaintiff's Exhibit No. 16, without objection.

Q. Will you mark on this photograph the top, showing the direction towards the apex of the vein?

A. Yes, sir. Witness marked the top of the picture "Top" in red pencil.

Q. If you can, by reference to the cross-section designated as Plaintiff's Exhibit 9, explain more clearly where this picture was taken and what it represents, you may do so.

A. This photograph was taken at a point about 20 feet westerly from the plane of cross-section V, being Plaintiff's Exhibit 9, and represents an exposure on a plane that is practically, if not absolutely, parallel to the plane of the [519—474] cross-section represented and depicted on this Plaintiff's Exhibit 9. '

Q. Now, if the Osborne fault is disclosed on that photograph, you may point out to the Court, if you will, the Osborne fault as distinguished from the vein, and mark it on the photograph.

Mr. GRAY.—Mark the fault in blue and the vein in red.

A. The lighter colored material shown by the photograph to the right-hand side and bounded by the inclined line marking the contrast between the

(Testimony of Alfred Frank.)

light and dark material, represents the Osborne fault; in fact, all of the lighter material photographed on the right-hand side of the picture is material and gouge of the Osborne fault. To the left of the line marked Osborne fault the vein appears which at this point consisted of very high grade galena ore. The higher grade or better quality of the ore is distinctly shown by the very dark portions of the photograph. Above that and in the extreme upper left-hand corner of the photograph is also shown a part of the vein, but not necessarily high grade ore.

Q. Can you give us approximately the angle of declination of the vein as shown on that photograph?
[520—475]

A. The hanging-wall of the high grade ore streak as shown on this photograph has a dip of about 42 degrees. The dip of the footwall portion of the ore streak of course corresponds with the dip of the fault, and it is shown on this photograph to be about 65 degrees at this point. I might add that at the time this photograph was taken I carefully leveled the camera with a spirit level, so that the angles shown thereon are really about correct.

Q. And how have you designated the vein as shown on that photograph, by what marking?

A. I have marked the vein in red.

Cross-examination.

(By Mr. GRAY.)

Q. Mr. Frank, what do you call what you have termed the apex of the vein on this line running from the point up in the Apex tunnel east to the end line

(Testimony of Alfred Frank.)

of the Senator Stewart Fraction claim?

A. I call the topmost portion of the vein the apex.

Q. That is the termination of the vein against the Osborne fault?

A. It is the termination of the vein on the Osborne [521—476] fault and in part against it, yes, sir.

Q. How long was this pick handle that you have nailed against the Osborne fault?

A. Why, I should say probably sixteen inches.

Q. What is the vertical distance between the top of that portion of the ground *is* shown and the bottom thereof on this photograph?

A. Assuming that the pick handle is approximately 16 inches long, I should say that that represents a height of between four and five feet.

Q. And what width does it represent on the top?

A. About the same.

Q. And at the bottom, as far as can be seen?

A. About the same. That black shadow shown at the bottom I think is caused by the shadow of the flash that was used in taking the photograph.

Q. What is the length of the exposure along the *lone* of the Osborne fault, as shown in that photograph?

A. Without having exact data to base the measurements on, but assuming that the pick handle is about 16 inches, I should say that the line of the intersection or demarcation between the vein and the fault as shown in that picture is [522—477] a trifle over four feet.

Q. I understood Mr. Gunn to ask you what the

(Testimony of Alfred Frank.)

angle of inclination of the vein was as shown on that photograph; is that your understanding?

A. Yes, sir.

Q. What is the angle of inclination of the vein as it comes against the Osborne fault?

A. About 65 degrees; that is, the footwall of the ore or vein at that point, and the hanging-wall of the Osborne fault.

Q. It is along the line where the vein comes against the Osborne fault? A. Yes, sir.

Q. Will you get the plan of the Stewart tunnel level, Exhibit 10, and just indicate to the Court on that plan the exact point where you took this picture?

A. I will say that at that point shown about five feet easterly from survey station 2512 the side of the drift was timbered part way up toward the top of the drift. In order to get the photograph we tore out some of the lagging, and that allowed the filling behind the lagging, and so on, to slough off for a distance of about four or five feet, in fact, the actual distance shown in the photograph, back [523—478] of the timber, so that the position which that photograph would occupy on this map—that is, the exposure shown—would be outside of the working as actually outlined on this map, and if I may draw it thereon, it would represent a sort of excavation made in that direction.

Q. Please mark that with an arrow, the point five feet east of that survey station, on Plaintiff's Exhibit 10, and you may put your name on it if you

(Testimony of Alfred Frank.)

want to; mark it "Point where photograph was taken." A. Very well.

Q. How did the ore lay at that point; what was the inclination of the ore seam?

A. The upper part of the ore seam, that is the hanging-wall portion of the ore seam lay at an inclination of about 42 degrees, 42 to 45. [524—479]

Q. It was exposed only toward this lagging, out?

A. No, in speaking of the ore seam there I am referring to the high grade ore seam, that which is distinctly marked on that photograph.

Q. How was your vein then laying at that point; was it flat or what?

A. It was laying at an inclination of about forty-two to forty-five degrees.

Q. And that is the general inclination of the vein at all points thereabouts, is it?

A. No, I would not say that it is the general inclination of the vein at all points thereabouts. There is another exposure of that same high grade ore streak in the small projection or crosscut extending out about five feet from the drift just a short distance westerly from the point 2512.

Q. Yes, sir; will you mark it, if you please, so that we can know what this is?

A. How will I mark it?

Q. Any way you want to. I do not care; mark it "F," on Exhibit No. 10.

A. At that point the same ore streak has a dip of [525—480] forty degrees.

Q. Of forty degrees at that point. Just mark that

(Testimony of Alfred Frank.)

also on this Exhibit No. 1, that "F" where the vein has a dip of forty degrees.

A. I did not say that the vein had a dip of forty degrees.

Q. Well, what dip has the vein there?

A. The actual boundaries or limits of the vein are not exposed in that particular working there, but that would probably represent a fair average dip.

Q. In that working? A. In that vicinity.

The COURT.—That is the dip of this high grade ore at that point?

A. Yes, sir; that is the only thing which can be accurately measured at that point.

Mr. GRAY.—And it dips in what direction in that little projection that you have marked "F"?

A. The dip taken there I should say is about south twenty west. The ore streak at that point lies very nearly, if not quite, parallel to the course of the Osborne fault. It is only at a very slight angle therefrom. [526—481]

Q. In making this model which you have cut on the bias and the section of which you have run at an angle of south nine degrees west—am I correct in giving the course?

Mr. DINES.—We object to the use of the term "on the bias" because that is unexplained and no witness has testified to it. We would like to have the facts instead of the comments of counsel in his questions.

Mr. GRAY.—It is very evident that that is exactly what it is, Mr. Dines.

(Testimony of Alfred Frank.)

Mr. DINES.—Let us show it. What I object to are the comments of counsel.

Mr. GRAY.—I am not commenting.

The COURT.—Well, the objection will be overruled.

Mr. DINES.—Exception.

Mr. GRAY.—Q. Make it at an angle of south 9 degrees west. That is the correct angle, isn't it?

A. That is approximately the angle of direction of the plane of section represented by the sheets of glass in this model.

Q. That is what I mean, yes, sir. Will you explain to the Court again why you took that course?
[527—482]

A. That course was taken as being one very nearly, if not quite, normal or at right angles to the direction of the Osborne fault as shown on the 400 level or Fir tunnel level and also as shown where the Osborne fault intersects or is intersected by the top or apex of the vein. It really would make very little difference, in so far as the general vision given by this model is concerned, whether these planes shift a trifle one way or another.

Q. In other words, it would make very little difference if a cross-section were taken diagonally through the stopes this way or along the course of the stopes so far as the effect on the eye is concerned?

A. So far as the effect where a great number of sections are combined is concerned, it makes absolutely no difference. By means of a series of connected sections such as are contained within this

(Testimony of Alfred Frank.)

model there is developed a surface or contour which in this case is a very much warped and irregular surface, being the surface of that vein. Now, did we have a section in any direction, each one of them representing the plane upon which they cut that surface, the combination of the entire dip would give the same results. [528—483]

Q. Now, if there is anything else you want to say in defense of it do it now.

A. I am not giving a defense of it.

Mr. DINES.—We object to that manner of counsel; we do not think it is proper for him to assume that attitude.

The COURT.—Yes, sir; I do not think that is proper.

Mr. GRAY.—Q. Will you explain to the Court why it is that every exhibit which you have produced in court here has been upon the scale of thirty feet to the inch until you have produced this exhibit?

A. Yes, sir, I can explain good.

Q. And this is upon forty feet to the inch?

A. The explanation of that is that the working map of the Stewart Mining Company, the map which is in constant use and the maps and prints which are made therefrom and which are in constant use are on a forty scale. This model was started before any map which was drawn on the—on the thirty scale was made. These maps drawn on a thirty scale are shown larger for the only purpose of having a better map or representation to look at from a distance, and the scale of the model was not in any way inten-

(Testimony of Alfred Frank.)

tionally [529—484] different from that of the map here.

Q. This model that you produced and the sections which you have presented as a portion of the model are accurate, are they?

A. I believe I stated yesterday that they were accurate in so far as it was possible for me to say so; yes, sir.

Q. The representation of the vein painted in red within the model is accurate? A. Yes, sir.

Q. It gives the accurate outline of the vein as developed?

A. It gives the accurate outline of the vein as developed and also as shown on other maps and cross-sections here in evidence.

Q. It gives the correct representation of the termination of the vein against the Osborne fault?

A. I believe it does.

Q. From the observations which you have been able to make thereof? A. Yes, sir.

Q. Will you give me the eighth cross-section in that model. I note the glass on top is frosted glass. Is [530—485] that so that you can clearly see the outlines of the planes on the surface?

A. The object of that was so that a light put at the top would give a diffused light. There is a very peculiar effect here when an electric light is used in illuminating this model; it shows the reflection of a lamp on each sheet; it is very confusing; whereas, on the other hand, if you put a light through the ground glass it gives a diffused light which does not

(Testimony of Alfred Frank.)

confuse in any way. Is this what you want (referring to glass sheet taken from model)?

Q. The scale, I understand is thirty feet to the inch? A. It is forty.

Q. Or forty feet to the inch? A. Yes, sir.

Q. The uppermost working shown on the section which is the eighth from the eastern end of this model is the one which you have presented here to the Court, is it not? A. Yes, sir.

Q. What is the highest working shown on the vein on that section? [531—486]

A. It is what is known as the lower Stewart tunnel level.

Q. Just point that out to the Court, will you. For what distance along the course of the Osborne fault and above that level have you projected the vein thereon? Along the course of the fault, Mr. Frank, please.

A. About fifty-five feet—sixty feet.

Q. What opening is there in that area which permits you or justifies you in projecting that vein upward for that distance?

A. There is no opening on the immediate plane of this section at that height, but there is an opening showing a greater width of vein that is now accessible, and it might be a matter of interest to mention that this passes right about through the point we were discussing a short time ago.

Q. That is, in through that little projection "F" from the Stewart tunnel level? A. Yes, sir.

Q. Where you say the vein has what inclination?

(Testimony of Alfred Frank.)

A. I did not say the vein. I said the high grade ore streak there could be shown to be accurately—accurately [532—487] measured—to have a dip of about forty to forty-two degrees.

Q. What did you say the dip of the vein was?

A. I thought that the vein had about the same dip.

Q. But you have painted the vein on here as though it rose there from that little projection at an angle of what?

A. Not at all. The vein is not painted there as though it rose from that projection. That projection would appear on this cross-section right about there.

Q. Between the two openings on the Stewart Tunnel level? A. Yes.

Q. And have you taken that opening into consideration and the exposure of the vein in there in determining whether you should paint it on this?

A. To the south of that little opening there is another drift shown.

Q. Whereabouts, Mr. Frank?

A. The drift marked as drift 5 E.

Mr. DINES.—To what exhibit did you refer, please?

Mr. GRAY.—On No. 1, on all of them. It is marked [533—488] just the same.

A. Both on No. 1 and No. 10, it is marked the same.

Q. Wherever it is shown. And you have no opening, however, above the Stewart tunnel level above which you have projected that vein and painted it

(Testimony of Alfred Frank.)

along the line of the fault for sixty feet.

A. There is no opening on the plane of this section. That the vein does go up beyond that, we are quite sure from other workings.

Q. What other workings?

A. Both to the east and west of that point; probably more particularly to the west.

Q. Give me where it is to the east of it.

A. I say more particularly to the west of it.

Q. All right; which ones to the west?

A. These stopes right here, for instance.

Q. Just those three stopes above the drift 5 E.

A. Those stopes are only about twenty-five or thirty feet westerly from the plane of this section.

Q. What is the course of those stopes?

A. About north 74 east.

Q. What is the dip of the vein in those stopes, Mr. [534—489] Frank?

A. In those particular stopes it is quite flat, it is flatter even than the degree which I mentioned, that of forty degrees.

Q. Yes, sir. By being flat, what do you mean; how flat?

A. I should guess it measured thereabout—it is not a guess, it is my recollection, at that point there about between thirty and thirty-five degrees.

Q. How does that give you the justification for painting this vein running away up along the Osborne fault for sixty feet, if you find that opposite it in the workings that you are taking into consideration the vein is flatter than that?

(Testimony of Alfred Frank.)

A. Because those stopes are made merely upon the merchantable or valuable ore contained within the vein; the vein extends to either side of those stopes for a very considerable distance.

Q. And the vein is not flat there?

A. The vein is probably not so flat as the stopes—as the stope section.

Q. Could you tell me what is the inclination of the vein there—what the dip of the vein is there? [535—490]

A. I have no note taken of the exact dip of the vein at each point of that sort, but the general dip of the vein is determined by its observation on different levels and projecting from level to level. That is the only fair way in which to obtain that.

Q. And that sort of data is used all through this.

A. And that sort of data is used all through.

Q. Through all these sections? A. Yes, sir.

Q. I would like to have the sections 9 and 10, if you please. Just lay those out. You have now presented the Court with section No. 9, Mr. Frank. That also accurately represents the vein as you have developed it in that ground, does it? A. Yes, sir.

Q. Mr. Frank, what is the highest working on the plane of that section?

A. I will say in explanation of the—

Q. Just answer it and then explain.

A. These sections drawn thereon in black show the different levels but they do not show the stopes. The stopes extend on the plane of this section above the level [536—491] shown thereon.

(Testimony of Alfred Frank.)

Q. What is the highest working shown on the plane of this section?

A. The highest working on the plane of that section is the stope which we were just referring to and is not drawn as a distinct working on this map—on this particular plane of section.

Q. Can you mark the plane of this section or the line of this section on the stope map, Exhibit 2? Where on the line of that section are those stopes shown?

A. My estimate was wrong by probably three feet. The stopes appear just—I scale on this map the stopes just above that level that are shown only three feet to the west of the plane of that section.

Q. Now then, come over to this cross-section again. How far above the Stewart tunnel level on the vein as you have painted it here do you show the vein extended—no, up toward the Osborne fault, toward its termination?

A. We show a distance of sixty-five feet.

Q. To the bottom? A. Yes, sir.

Q. All right— [537—492]

A. Of which distance, though, forty feet has been stoped only three or four or five feet westerly of the plane of this section.

Q. Now, come over here. From the Stewart tunnel level up to the upper portion of the red as you have projected it and painted it upon this section, how far have you shown it? A. 110 feet.

Q. Now, just one more question, and I will be through with you, the sections following this. The

(Testimony of Alfred Frank.)

uppermost workings shown upon this section 10 is also the Stewart tunnel level, isn't it? [538—493]

Q. How far have you projected and painted that vein from that section to the lower point of its intersection with the Osborne fault, the termination of the vein against the fault? A. About 93 feet.

Q. How far from the Stewart tunnel have you projected it to the point where you have shown it at its highest point of termination? A. 170 feet.

Q. 170 feet of projection?

A. Of this part, though, there is a horizontal distance of 45 feet and a vertical distance of probably 30 feet actually stoped.

Q. On the line of that section? A. Yes.

Q. Mr. Frank, as a matter of fact, from the point where the Stewart tunnel level is shown on that section, along that section, there is not an opening, is there; come over here so the Court can see it—there is not an opening above the Stewart tunnel level on the line of that section, is there, where you have projected and painted that vein for 170 feet? [539—494] A. There is a stope—

Q. Now, answer yes or no, and then explain.

A. I will say that there is an opening above the Stewart tunnel level, up above the southerly portion of the Stewart tunnel level.

Q. Yes; that is over the portion of the Stewart tunnel level that is shown away over here.

A. The stopes extend above that portion.

Q. Point that out to the Court, that portion of it which is to the south. A. Yes.

(Testimony of Alfred Frank.)

Q. From the Stewart tunnel level as shown on this exhibit, the most northerly opening on that level, you have projected that vein upon that section without an opening for 170 feet, and painted it upon this exhibit? A. In part, yes.

Q. In whole, haven't you?

A. I said no, because it is not all of 170 feet.

Q. Where is there an opening on that section other than the northern portion of the Senator Stewart tunnel level, within 170 feet of the upper portion of that vein as shown upon that cross-section? [540—495]

A. There is no opening in between those two points which you now refer to.

Q. And there is not an opening on the vein within 170 feet of that point where you have painted the vein against the Osborn fault, is there?

A. Yes, there is.

Q. Where is it?

A. The stopes extend over that portion of this drift.

Q. Over what portion? A. Right over here.

Q. That is over the northerly portion. You can scale it on Exhibit 2 here, can't you?

A. I haven't got the line on there, but I can put it on.

Q. You have got this line here; it is just the next section?

A. These stopes extend to a point directly over this portion. They would not—

Q. Just come over here and put your pencil on the

(Testimony of Alfred Frank.)

map on the line of that section and show the Court where they extend over that portion?

A. Right there. Isn't that directly over it? [541—496]

Q. How high over it, Mr. Frank?

A. This stope map shows three floors, which would in the ordinary course put it at about 20 feet.

Q. That is on the southerly side of that tunnel level? A. Yes.

Q. Is that within 170 feet of the point where you have projected and painted this vein?

A. It is about the same, yes.

Q. Now, the fact is that there are no workings above what you have called here the east No. 3 cross-cut up toward the point where the Osborn fault is supposed by you to exist, are there?

A. There are workings there. There is an exposure of the Osborn fault and the point where the vein joins or ends against it.

Q. Where? A. In the Apex drift.

Q. But is that on the line of either of these sections that I have been examining you about?

A. No, sir.

Q. On the lines of those sections is there any opening above this Stewart tunnel level? [542—497]

A. There is not.

Q. And you have simply projected and painted the vein going up there on these cross-sections?

A. With the known position of that same intersection of the vein and fault on the Apex drift to guide our projection, as well as the known intersection of

(Testimony of Alfred Frank.)

the vein and the Osborn fault on the tunnel level at several points further down, to guide our projection.

Q. And showing the vein gradually rising on the planes of these sections toward the intersection of the Osborn fault? A. Yes.

Q. Isn't it true that there is in this vein a fold, Mr. Frank? A. Yes.

Q. Notwithstanding that, it continues to rise through the fold against the fault, does it?

A. I believe it does above that fold.

Q. What makes you believe that; have you ever seen it above that place?

A. No, sir, but I have seen it on the planes of section taken on either side of the planes of section which [543—498] you have questioned me about.

Redirect Examination.

(By Mr. GUNN.)

Q. Mr. Frank, your model, with the workings shown upon it discloses that the vein is projected from certain points, does it not? A. Yes, sir.

Q. And you may state now generally the data used by you in making those projections?

Mr. GUNN.—We might mark the tracing Exhibit No. 15-B, which is a tracing of the planes of section shown in the model, and the model might be marked 15-A.

The COURT.—Very well.

A. I will first state that this tracing represents what might be termed a template when placed on top of the plan map, Plaintiff's Exhibit 1, and as such

(Testimony of Alfred Frank.)

template represents the lines of the planes of sections upon which the sections represented by the glass plates in the model were taken, and the lines as shown on this tracing or template are brought in accordance with the number of the planes represented by the glass plates in this model, [544—499] beginning from the easterly end as number one. Beginning with the section or plate No. 1 of the model, we have an exposure of the Osborn fault and the vein at the point at which the line representing the plane of this section cuts through the 400 or Fir tunnel level just east of survey point No. 2,537. There is at that point a distinct exposure of both the vein and the Osborn fault. Passing to section or plate No. 2, we have on that—

Mr. GRAY.—It seems to me that this is not re-direct. It was gone over before.

Mr. GUNN.—I am inclined to think it is. I am asking him now to give the data from which he made those projections. Those projections were developed by the cross-examination on this model.

The COURT.—You went over the same subject yesterday to some extent. If you desire him to elaborate it or make it more minute, perhaps it might be considered direct examination.

Mr. GUNN.—Very well. I will ask leave to have him make it more specific.

The COURT.—Very well. But any new matter will be subject to cross-examination. [545—500]

Mr. GUNN.—Yes, sir.

(Testimony of Alfred Frank.)

WITNESS.—(Continuing.) On plate No. 2 we have an exposure of the Osborn fault on the 300 foot level and also on the 400 or Fir tunnel level, both of which are cut by the plane of this section. Also the vein is cut on both of these levels by the plane of this section.

On section No. 3 we have the vein cut on the 400 or Fir tunnel level, the vein and fault cut on or very close to the 300 level and the fault—I am referring always to the Osborne fault—the Osborne fault cut on the 200 foot level. I could give the exact distances of the points at which these cuts are made.

Q. I think your general designation is sufficient. You may proceed as you have been doing.

A. On section No. 4 we have actual intersections and consequent exposures cut on the plane of this section on the 300 foot level of the vein, and on the 200 foot level of both the vein and the fault.

Q. If you could conveniently make your description from this side, perhaps his Honor may see and hear better.

The COURT.—I can see very well.

WITNESS.—(Continuing.) —and also in raise No. 218 [546—501] east, extending between the 200 and the 100 or tunnel level, at the end of the tunnel level, we have an exposure of the fault which is cut by the plane of this section.

On plate No. 5 we have an exposure of the vein and fault in or at about the level of the 100 in the raise No. 218 east. We have an exposure of the vein on the 200 foot level and on the 300 foot level, and this

(Testimony of Alfred Frank.)

section does not go to the 400.

On section No. 6 we have an exposure of the fault in the lower Stewart tunnel level, of the fault in the raise between the lower Stewart tunnel level and the 100 foot level, of the vein on the 100, of the vein on the 200, and of the vein on the 300, and I might add that there are exposures of the vein and the fault in the stopes between the different levels, as I pass.

On No. 7 we have an exposure of the fault on the lower Stewart tunnel level, of the vein on the 100, of the vein on the 200, and of the vein on the 300.

On No. 8, which section has been referred to here particularly, we have an exposure of the vein and fault on the lower Stewart tunnel levels, of the vein on the 100 and of the vein on the 200; also of the vein on the 300 [547—502] at the extreme southerly end of the plate or section.

On No. 9 we have an exposure of the vein on the lower Stewart tunnel level and on the 100 and 200 foot levels.

On No. 10 we have the same. Section No. 10, though, is also only a very short distance easterly from the end of the exposure of the vein in the Apex drift.

On section No. 11 we have an exposure of the fault and the vein above the Apex drift, we have exposures of the vein at three different points where this section cuts the lower Stewart tunnel level, also where it cuts the 100 foot level.

On No. 12 we have an exposure of the vein in the Apex drift and in the stopes between the Apex drift

(Testimony of Alfred Frank.)

on the lower Stewart tunnel level, and there are three exposures of the vein in or just above the lower Stewart tunnel level, also on the 200.

On No. 13 we have the vein in the Apex drift and in the lower Stewart tunnel level and in the stopes between the 100 and the lower Stewart tunnel level.

On No. 14, about six feet east—about five or six feet east of the plane of the cross-section we have the first intersection with the Clancy fault.

Q. Now, have you passed westerly of any point where [548—503] the Osborne fault is exposed?

A. Yes—that is to say, no, we have not.

Q. Very well, go on.

A. I omitted one place where the Osborne fault is exposed on plate No. 12, where it is exposed not only near the plane of this section on the Apex drift, but is also exposed in the Fir tunnel, or 400 foot level.

Q. Now, state whether or not the projection of the vein and of the Osborn fault as shown on this model correctly represents the vein and the fault through those projections as based upon the data to which you have referred and your knowledge of the actual condition of the vein and of the fault where exposed?

Mr. GRAY.—I object. No man in the world can answer that question, because he has not projected between, but he has projected beyond, 170 feet beyond.

Mr. GUNN.—It is an opinion of course.

The COURT.—Objection overruled. It can go in for what it is worth.

A. The model correctly represents the vein and

(Testimony of Alfred Frank.)

fault as exposed on the planes of these various sections, and where not exposed on the planes of these various sections it [549—504] represents projections from known exposures on the planes of sections to either side of those upon which it is not exposed.

Q. And these exposures are in the levels as well as in the stopes? A. Yes.

Q. I will ask you, then, to put that tracing over this stope map, Exhibit 2, and point out, if you will, the development of the stoping beyond the point of development as shown upon the plan map, that is in the sections in which these projections are made.

A. I could go over each one of these plans again and show the length and also the depth or height of the stopes which are intersected by each one of the planes of this section—

Mr. GRAY.—I object to that as repetition. Just by laying the tracing on there the Court can see it just as well as if Mr. Frank should repeat it.

The COURT.—It is not necessary to repeat it.

WITNESS.—I was going to say that I could do that, but it can be seen very readily.

Q. Now, directing your attention—put the tracing back [550—505] over No. 1 again if you please—we will take cross-section No. 11, in which you say you have an exposure of the vein and the fault in the Apex drift, and also an exposure of the vein in the workings below. What would be the distance of the projection of the vein, take into consideration the exposure above and the exposure below; what would be the real projection?

(Testimony of Alfred Frank.)

A. I can give that better on the stope map than on No. 1. I can put that line on the stope map.

Mr. GRAY.—I object, because he did not use the stopes at all in making these sections, but he just used the principal workings.

WITNESS.—That is not true. The stopes were used in making this model.

Mr. GRAY.—All right. Go on.

A. The projection amounts to almost nothing, as on the plane—at one point it is only two feet westerly from the plane of this section to the point where we have the actual stopes between the lower Stewart tunnel level and the Apex drift, these stopes extending continuously from the lower Stewart tunnel level to a point only about 15 feet below the elevation of the Apex drift. [551—506]

Q. Will you point out, please, on the map the points between which you stated to counsel that there was a projection of 170 feet?

A. As I have stated,—that was on section No. 10, I think—No. 10 is 50 feet to the easterly from No. 11, and while it does not cut these same stopes and there is that distance as shown on the immediate plane of this section without openings, 50 feet to the west of the plane of this section we have continuous stopes between the lower Stewart tunnel level and the Apex drift.

Q. Supposing that you have an exposure in the Apex drift and an exposure in the workings below and the distance between those two exposures is 170 feet, would you say that the projection was of 170

(Testimony of Alfred Frank.)

feet or is it half of that distance, 85 feet each way?

Mr. GRAY.—I object to cross-examining Mr. Frank. He has been very frank about his testimony.

The COURT.—Objection sustained.

Mr. DINES.—We submit that where opposing counsel between two known points draws a line 170 feet and says the projection is 170 feet, it is a misleading question and a wrong assumption. [552—507]

The COURT.—The Court understood that in the beginning.

Mr. DINES.—The record should show that, because the assumption is wrong. It would be half of 170 feet, or 85 feet.

Mr. GRAY.—Mr. Dines can be sworn as a witness. They have two or three witnesses left.

The COURT.—That still would not permit you to cross-examine your own witness, who has more than thoroughly covered it.

Mr. GUNN.—That is all.

Mr. GRAY.—That is all, Mr. Frank.

Witness excused.

The COURT.—Now, Mr. Clancy, you can replace this plate on the model, if you please.

Mr. GUNN.—We offer the model in evidence.

Model admitted in evidence, marked Plaintiff's Exhibit No. 15-A.

Mr. GUNN.—We also offer the tracing in evidence.

Tracing admitted in evidence without objection

marked Plaintiff's Exhibit No. 15-B.

Mr. GUNN.—There is a suggestion that I think counsel [553—508] will admit, that the record should show that this model was submitted to them for their consideration last evening, and that they were given an opportunity to take it apart and to study it.

Mr. GRAY.—Yes, we will admit that.

The COURT.—Let the record so show. [554—509]

[**Testimony of Cyrus F. Tolman, Jr., for Plaintiff.**]

CYRUS F. TOLMAN, Jr., after being duly sworn as a witness for plaintiff, testified as follows:

Direct Examination.

(By Mr. DINES.)

Q. Mr. Tolman, please state your full name.

A. Cyrus F. Tolman, Jr.

Q. Your residence. A. Palo Alto.

Q. And your occupation.

A. I am a mining geologist and a teacher of economic geology.

Q. With what institution are you now connected?

A. With the Leland Stanford, Jr., University.

Q. Did you have any technical training in any school to fit you for this profession?

A. I graduated in 1896 from the University of Chicago in the geological department. I was Fellow in Geology in 1897 and 1898.

Q. And what degree did you receive in your technical training? [555—510]

(Testimony of Cyrus F. Tolman, Jr.)

A. In 1896 I received the degree of B. F.

Q. Now, from what time on, what actual experience have you had in following this profession; with what companies have you been associated and over what scope of country have your observations and studies extended?

A. In 1899 to 1900 I was chemist for the Anaconda Copper Mining Company, during which time I made a special study of the chemistry of copper ores, and investigated specially the secondary enrichment of that ore. From 1900 to 1913 I have been in active practice as a consulting mining geologist. 1905 to 1912 I was head of the Department of Geology and Mining at the University of Arizona. 1910 to 1912 I was territorial geologist of Arizona. 1912 to 1913 I have been in charge of the teaching of economic geology at the Leland Stanford University, with the rank of Associate Professor.

Q. Now, over what States have your observations extended?

A. My observations have extended especially over the southwest of the United States, and the northwestern portion of Mexico. And, as I stated before, I also was employed in studying the ore deposits in the vicinity of Butte, Montana. [556—511]

Q. For how long a period did you study ore deposits at Butte, Montana?

A. For a time probably of several months; probably six months.

Q. For what company?

A. For the Anaconda Copper Mining Company.

(Testimony of Cyrus F. Tolman, Jr.)

Q. What study or experience have you had along the lines of the origin and character of ore deposits?

A. The subject of ore deposits has been my especial study. In pursuance of this I have examined practically all of the important mines of Arizona. I have made detailed examinations of a great many mines and prospects in Arizona and Sonora; as the territorial geologist I collected data regarding the deposition of ore and ore deposits, especially regarding replacement ore deposits, of which we have a large number in Arizona. I have studied all other structures incidental to the deposition of ores, such as the effect on ore deposition, of faulting and fracturing and folding of the rock.

Q. Are you familiar with the ore deposits as far as they are developed in the Senator Stewart Fraction lode mining claim, the Senator Stewart lode mining claim and the adjoining claims, and in the Ontario, as shown on Exhibit 1? [557—512]

A. I have examined most of the accessible workings as shown on Plaintiff's Exhibit 1, and am familiar with the ore deposits shown therein.

Q. When did you first make your first examination of the mining properties of the Stewart Mining Company?

A. I first examined the mining properties of the Stewart Mining Company, from October 1st or 2d, 1912, for a period of three days. During that time I made a preliminary examination of the properties in order to determine whether my opinion in regard to these properties and the result of my studies cor-

(Testimony of Cyrus F. Tolman, Jr.)

responded with those of the staff engineers of the Stewart Mining Company.

Q. Was that in relation to the present litigation?

A. It was.

Q. And how extensively did you go through the property at that time?

A. At that time I went through the property—through the Fir tunnel, I examined the ore at a cut which is now shown on Plaintiff's Exhibit 1 at point 2513. At that time I made a trip up through the stopes and out in the 300 foot level. I also went along the accessible workings of the 300 foot level and descended through the stopes into the Frank ore [558—513] body at the west, examining what could be seen of the ore in these workings. I visited the 200 foot level, and I did not make a detailed examination of these workings (indicating) as at that time the workings were not made beyond here, and I went out to the level and went up these raises and examined the stopes here up about raise 218 and 218, the stoping that they have above drift 205 west, above points 2067, 2062, 2066 and 2087. I did not visit, the 100 foot level at all during that trip, or during my present examination. I went up to the tunnel level, or the old Senator Stewart tunnel level, and I went up in that raise, a raise known as raise No. 2 west. I went northeast along the 100 foot level and went up through raise 4 east to the surface. At that time the Apex drift was not driven. I also visited a cut—

Q. That last statement that you made, was that on the 100 foot level?

(Testimony of Cyrus F. Tolman, Jr.)

A. No, sir, that was on the tunnel level. I did not visit the 100 foot level.

Q. Well, can you state generally, without asking for the details, Mr. Tolman, whether you examined, with the exceptions that you have named, the accessible workings? [559—514]

A. I examined a good portion of the accessible workings on my first trip.

Q. Now, after that what extent of observation have you had of this mine?

A. I made a second trip to the mines, leaving Palo Alto December 4th and returning December 20th, during which time I made a more detailed examination of the accessible workings.

Q. And after that, what other observations have you made?

A. From January 2d to the time of the lawsuit I visited the workings practically daily.

Q. Are you able to determine, as the result of the observation and study that you have made of this vein, what character of vein it is?

A. I am. The vein is a replacement vein. By a replacement vein I mean a vein which is formed by the solution of the country rock and the simultaneous precipitation of the ore through chemical reactions. The Senator Stewart vein is undoubtedly a replacement vein, and as a replacement vein it shows the irregularities that we might well expect from such a vein. A replacement vein is deposited [560—515] very often in a more soluble rock than the quartzite. The replacement veins, for instance, in Arizona are

(Testimony of Cyrus F. Tolman, Jr.)

largely in the limestone, and there, the rock being very soluble, these veins spread out in most fantastic form, spreading out through the soluble layers of the rock, extending for hundreds of feet beyond the line which might be considered the average line of the dip and strike. [561—516]

The Senator Stewart vein does not show anywhere near as wide departures from the ordinary shape of the deposits as do these deposits in the more soluble limestone. The replacement vein in the workings of the Stewart Mining Company is a replacement ore body in quartzite, and quartzite is not as soluble a rock as the limestone. The shape, therefore, of the ore body is not guided by the solubility of the quartzite but by the presence of gouges, by presence of dams, by the presence of impermeable layers of gouge in the rock. The solutions ascending striking these gouges or impermeable layers and not being able to get through these layers have spread out underneath these layers, have cut out across country, have formed shapes which are governed then by the said gouges.

Q. What are the distinguishing characteristic irregularities of replacement as compared with ordinary fissure veins?

A. An ordinary fissure vein, so called, is a deposit formed in a fissure. It is a tabular deposit and its form depends on the shape of the fissure. The fissure is generally filled with ore, and therefore the boundaries of the ore are sharply determined by these fissures. [562—517] The other features—

(Testimony of Cyrus F. Tolman, Jr.)

the ore in the fissure is precipitated along the sides of these fissures, and therefore shows a banded structure parallel to the fissuring. Very often there will be separate bands showing the different changes in solution, but these bands are always approximately parallel to the fissure or the fissure that guarded the solution.

Q. How is it in a replacement vein?

A. While in replacement ore deposits the ore spreads out either in the soluble layers as I have already stated, or by limestone ore deposits replacing the country rock. The replacement here may be so perfect that the ore will retain all the structure of the replaced material, and in that case we may have a banded deposit but the bands will be the bands of the country rock and will not be parallel to the lines of the fissure.

Q. What about the irregularities of dip and strike of replacement veins as compared with dip and strike of fissures?

A. The replacement veins vary in the dip and strike far more than any fissure veins of which I know. They spread out in almost any conceivable form. [563—518]

Q. Now, taking the result of your observations here, did you from your own personal investigation and observation of the ground satisfy yourself as to where the top or apex of the vein disclosed in the Stewart workings is with reference to the surface boundaries of the Senator Stewart Fraction lode mining claim? A. I did.

(Testimony of Cyrus F. Tolman, Jr.)

Q. Please show to the Court where the apex of that vein is with reference to those boundaries? Designate it yourself and use any of the exhibits already in evidence.

A. The apex is shown here projected on the plane of the map, Plaintiff's Exhibit 3. The apex is shown on Plaintiff's Exhibit 3 projected on to a horizontal surface; that is, it shows the true horizontal position of the apex. We cannot get the vertical position of that without going through the mine workings, and the apex runs approximately ten feet below the surface in the Apex drift, and it is shown ten feet from the surface of raise 4 east. It is also shown in the Apex drift extending—or shown near point 2502 at the intersection of the Osborne fault with the vein material. The apex is also shown on the old lower Stewart tunnel level. It is shown in a drift [564—519] which is the extension of No. 3 crosscut. This apex may be examined in this drift, in the drift itself showing very plainly at a point west of raise 218. I have not seen the apex itself all the way down this raise, as the ore rises slightly above the raise, but to all practical purposes the apex extends down raise 318 east to the 200 foot level and from there it can be traced down through the workings to a point near point 2537 on the little drift off the Fir tunnel.

Q. Now, what course does the apex take generally from the point where it crosses the easterly side line of the Senator Stewart Fraction and to the Apex drift where it is exposed above there and from there

(Testimony of Cyrus F. Tolman, Jr.)

to where the apex crosses the southerly side line of the Senator Stewart Fraction?

A. The apex approximately takes a northwesterly course from the point designated on the Fir tunnel level up to the point of apex, the actual point under the surface of the wash. From there the apex extends in a southwesterly direction crossing the side line of the Senator Stewart Fraction at the top of raise 2 west.

Q. Why do you call it the apex of the vein?
[565—520]

A. Because it is the upper termination of the vein. It is the upper terminal edge of the vein.

Q. Now, what can you say—take a point from the point that you have already disclosed in the top of raise, draw a line from that parallel with the easterly end line of the Senator Stewart Fraction claim, what can you say as to all the workings that are disclosed easterly of that line, do they belong to one of several veins, and if so, what vein?

A. All east of the line designated from the point of the raise 2 west approximately at right angles to the side line of the Senator Stewart Fraction, all of the vein shown in the workings southeast of that line, all of the workings are on the Senator Stewart vein.

Q. To what vein do the ore bodies that you have referred to underneath the surface of the Ontario claim belong?

A. They belong to this same Senator Stewart vein, or the old Stewart vein.

(Testimony of Cyrus F. Tolman, Jr.)

Q. Where is the apex of the bodies of ore lying in the Ontario claim?

A. The apex of the ore bodies lying in the Ontario [566—521] claim lies as exposed nearest the surface in raise 4 east at a point about ten below the surface of the ground.

Mr. GRAY.—I wish you would read that question again, please.

(Question read.)

Mr. DINES.—Q. The apex of the vein to which they belong.

A. The apex of the vein. This would show the point of apex nearest the surface (indicating).

Q. What line of apex?

A. This line of apex I have already traced is approximately shown on Plaintiff's Exhibit 3, in this direction here (indicating).

Q. If you project vertical planes, the one through the easterly end line of the Senator Stewart Fraction projected, and one parallel to the end lines through the point where the apex on Exhibit 3 crosses the southerly side line of the Senator Stewart Fraction, will the ore bodies of the Ontario lie between those vertical planes indefinitely projected in their own direction and vertically downward into the earth? A. They will. [567—522]

Q. Have you looked at this model, Plaintiff's Exhibit 15-A? A. I have.

Q. Does that represent or illustrate the conditions as you found them there in your examination?

A. I have not made the necessary projections to

(Testimony of Cyrus F. Tolman, Jr.)

show the margins of the ore bodies, but the ore body as a whole passes through approximately that direction.

Q. On the 400 level I would like to get some data from you, if you please. What is the strike of the Osborne fault in that portion of it that is disclosed in the 400 level?

A. The Osborne fault is shown in drift 405 east at the extreme end of the drift or face in here. It is also shown in the Fir tunnel, and it is also shown in the lateral from the Fir tunnel. It is also shown in a point out from the cross-cut designated as 400 north. The strike of the Osborne fault at this level is north 80 west.

Q. What is the dip of the Osborne fault at that level?

A. The dip of the Osborne fault averages 65 degrees at a point designated by my ruler, which is a point about [568—523] ten feet northeasterly from point 2513.

Q. What is the strike of the Stewart vein at the same place?

A. The strike of the Stewart vein as disclosed in drift 405 east is south 88 west.

Q. What is the dip of the Stewart vein at that point?

A. The dip of the Stewart vein at that point is 45 degrees in a southerly direction.

Q. What are the strike and dip of the Osborne fault as you find it on the 300 level?

A. I might add to that, that the included angle

(Testimony of Cyrus F. Tolman, Jr.)

between those two is twelve degrees.

Q. I beg your pardon; I did not catch that.

A. In regard to the two strikes, I might add that the included angle between those strikes is approximately twelve degrees.

Q. Yes, sir; I should have asked you that. The included angle, that is on the 400?

A. On the 400 foot level.

Q. Three hundred foot level, please give the same data both as to the Osborne fault and the same vein and the angle? [569—524]

A. On the 300 foot level the Osborne fault strikes north 70 west; it dips in a southerly direction at 70 degrees. The vein strikes south 88 west; it dips in a southerly direction fifty degrees.

Q. And what is the angle?

A. The included angle between the two is 22 degrees.

Q. Now, on the 200 level?

A. The 200 foot level, the strike of the Osborne fault is north eighty west; its dip is seventy degrees in a southerly direction, and the strike of the vein is south 76 west, and its dip is fifty degrees.

Q. The angle?

A. The angle between the two is twenty-four degrees.

Q. Between the vein and the fault. Was what—how many degrees? A. Twenty-four degrees.

Q. Now, at the Apex drift.

A. By skipping the tunnel level, the Apex drift—

(Testimony of Cyrus F. Tolman, Jr.)

Q. Before you give that, you had better give that on the tunnel level.

A. The strike of the Osborne fault on the tunnel level is north 70 west; its dip is 80 degrees; the [570—525] strike of the vein is south 85 west, and its dip is 35 degrees in a southerly direction. Both fault and the vein dipping in a southerly direction, the included angle is twenty-five degrees.

Q. What do you refer to—will you indicate with your pointer on Exhibit 1 what you refer to as the tunnel level in the last?

A. In this point, all of these points are taken within fifty feet of the apex as shown in the workings.

Q. Now, your Apex drift, give us the same data, if you please.

A. The Apex drift, the strike of the Osborne fault is north 75 west; its dip is sixty-five degrees southerly. The strike of the vein as disclosed in the eastern end of the tunnel is south 83 west. The included angle is 23 degrees. The dip of the vein at that point I have not noted in this place, but it is approximately forty degrees.

Mr. DINES.—You may take the witness.

Cross-examination.

(By Mr. GRAY.) [571—526]

Q. Professor, you agree, I understood you to say with Mr. Clancy so far as he has testified and shown the courses of the various levels and the vein upon those levels?

Mr. DINES.—I object to that, your Honor; I do

(Testimony of Cyrus F. Tolman, Jr.)

not think it is a proper form of examination; it assumes that he has answered a question with reference to what Mr. Clancy testified.

The COURT.—He said on his first examination he agreed with the staff engineer. He did not mention Mr. Clancy's name.

Mr. DINES.—Yes, but as to the conclusions, not the data; this question relates to the data.

Mr. GRAY.—I am perfectly willing, if he disagrees with Mr. Clancy's conclusions, to eliminate from the questions the conclusions.

Mr. DINES.—He may not have heard it, and may not know what they are; I think, in fact, he did not hear it.

The WITNESS.—What is the question?

Mr. GRAY.—I understood you to say that you agreed with Mr. Clancy in his mapping of the workings and in the courses of the drifts and workings and vein which he had [572—527] determined from his careful examination extending over a year and a half.

Mr. DINES.—One moment, Professor. Please do not answer that question. I object to that question because it is improper, misleading, assumes things the witness has never stated and that counsel has nothing whatever to draw such an inference from.

The COURT.—I think the objection should be sustained. That is not what the witness stated, Mr. Gray. He did not mention Mr. Clancy's name.

Mr. GRAY.—Q. Who is the staff engineer to

(Testimony of Cyrus F. Tolman, Jr.)

whom you referred?

A. I referred in respect to the apex as being—

Q. No, Mr. Tolman, in this examination answer my questions. A. Mr. Clancy.

Q. You agree with the staff engineer, Mr. Clancy, and with the investigations which he has made showing the courses of the vein and its inclination and openings upon it?

A. I agree with Mr. Clancy in regard to the mine workings, but the courses of the veins that I have [573—528] just given were taken entirely by me.

Q. If they disagree with Mr. Clancy's testimony, you disagree with him, do you, in that respect?

A. In that respect I do.

Q. Now, Professor, I understand that you have given a particular attention in your study of geology to the question of faults? A. Yes, sir.

Q. I presume that you have in your investigation of this property given particular attention to the faults which you found there?

A. I have studied the faults that I found there.

Q. There is a fault which has been called here the Clancy fault, Professor? A. Yes, sir.

Q. You are familiar with it? A. I am.

Q. And is there anything disclosed in the developments which will justify you in stating what the throw along that fault was? A. I think not.

Q. So far as the workings show it is impossible to [574—529] say whether it was ten feet or one hundred feet; is not that true, Professor? A. No.

Q. What is the fact with reference to the throw?

(Testimony of Cyrus F. Tolman, Jr.)

A. The vein is discontinuous beyond the Clancy fault. The vein cannot be traced—the Senator Stewart vein cannot be traced and identified absolutely in a northwesterly direction from the Clancy fault, and while we cannot determine what the throw is because we cannot identify the vein, we also cannot say what the throw is not.

Q. No. Well, that is what I say, you cannot say what it is or what it is not?

A. The amount of movement here cannot be determined because there is no vein that can be correlated beyond the Clancy fault with the Senator Stewart vein.

Q. Yes, sir. It cannot be determined from the workings which you have visited and from the investigations which you have made; is that what I understand you to say? A. Yes, sir.

Thereupon a recess was taken until 2:00 o'clock P. M. of this day, Friday, January 10, 1913. [575—530]

Friday, January 10th, 2 P. M.

CYRUS F. TOLMAN, resumed the stand for further

Cross-examination.

(By Mr. GRAY.)

Mr. GUNN.—There is one correction that the witness desires to make, your Honor, before the cross-examination proceeds.

The COURT.—Very well.

WITNESS.—In my dip of the vein on the Apex drift I should have read it as 60 degrees instead of

(Testimony of Cyrus F. Tolman, Jr.)

70. I did not read my notes correctly.

Mr. GRAY.—(Cross-examination resumed.)

Q. Professor, what faults do you wish the Court to understand you as saying have pre-existed the vein? A. Those faults under which the ore makes.

Q. Name them.

A. There are a very large number of little fractures. As far as I know there is no great structural fault later than the vein, but there are a great many gouges especially between the 300 and 400 foot level.

Mr. DINES.—I wish you would read that answer and see if [576—531] the witness made the statement he intended.

(Answer read.)

WITNESS.—I will correct that. There is no great structural fault that does not cut the *cut the* vein.

Q. These little gouges and cracks that you speak of structurally are not comparable to either the Osborne fault or to the Clancy fault or the No. 11 fault?

A. Certainly they are not comparable, but they are sometimes cut very sharp; they have apparently good sharp walls, and to all appearances they seem to be pretty sharp slips. They might be easily *be* mistaken for important faults.

Q. In your judgment, what has that got to do with this case?

Mr. DINES.—We object to that as immaterial, asking him to draw a conclusion of law.

(Objection sustained.)

Q. Now, Professor, we will go down to the Fir tunnel. Where was that point where you took the

(Testimony of Cyrus F. Tolman, Jr.)

strike of the vein that you say shows that the vein has a course of south 88 west? A. The vein?

Q. Yes. [577—532]

A. That strike I took along drift 405 east. I obtain the strike of the vein at that point by looking at the ore in the face of the drift and looking at the structure of the ore and sighting in that direction.

Q. Now, has it that course along the entire drift which you have mentioned?

A. That course is my nearest approach to the average course of that vein for a distance along that drift. Of course I could not make the examination every inch, but that is my best judgment.

Q. Just point that out to the Court.

A. It is this strip right here.

Q. The drift from point 2513—

A. From 2513 to 2537, yes.

Q. For what length does the vein have the course which you have described to the Court?

A. That is the only place that I could get a satisfactory strike. I think the probability is the strike may change, but that is the strike as near as I could get it for a distance of about 50 feet from the fault. All my strikes were within a distance of 50 feet from the fault.

Q. From that point approximately 50 feet from the fault [578—533] to the most southerly workings on that level, what is the general course of the vein?

A. I could not give it to you for such a long distance, because the arc there changes, and I could not give it any more than I could give you the gen-

(Testimony of Cyrus F. Tolman, Jr.)

eral strike of a circle or a portion of a circle.

Q. You say on that level that the vein in its course described the arc of a circle?

A. No, I don't say, that, but I say I could not give you the average there.

Q. I did not ask for the average; I asked for the general strike. See if you can give that.

A. I don't believe, Mr. Gray, that I can give you the strike from my own observations except the strike in the vicinity of the Osborne fault. That is the only place that I have made very detailed observation.

Q. Didn't you consider that, in order to be able to testify as to this vein and its relation to the lines of the claims, that you should take its strike at places other than the points within 50 feet of the fault?

A. I don't think that I needed to study it in such detail as to give the exact strike. The direction I can [579—534] give you approximately, if that is what you want, for the different portions.

Q. Why did you consider it more important to take the strike of the first 50 feet instead of that of the last 750 feet?

A. Because that is the portion that I studied especially.

Q. We have here the plan map of the 400 foot level, Plaintiff's Exhibit No. 14. Point out to the Court on there where you took the strike.

A. This is the drift. I do not see it named on here, but this is the same drift.

Q. You pointed to that part of course?

(Testimony of Cyrus F. Tolman, Jr.)

A. Yes. I don't see the name on it.

Q. That is the drift which is shown right along the edge of the vein against the fault approximately?

A. Well, it goes against the fault up here. The fault dips and throws the vein down in the bottom of the working, of course, and you get your exposure there by going up. It is platted apparently showing that it is down in the middle.

Q. The platting is not quite correct then?

A. No, the platting is correct as far as I know. I [580—535] say that you cannot get the strike from that point of the vein; as you get away from that 50 feet you get the strike of the vein.

Q. That is purely a local strike that you took at that place?

A. No, it is not a local strike; it is the strike for about 50 feet along there.

Q. Now, let us take the strike of the vein from the point at which I now place my pointer, along for another 50 feet, and tell us what that is, where the vein leaves its termination against the Osborne fault, the footwall of it; what is the strike there?

A. Well, the strike is approximately shown by that line, I suppose.

Q. Well, what is it, Professor?

A. The strike is approximately shown by the direction of the stopes in drift 405 east; approximately, I should say, about south 40 east.

Q. That is the footwall, is it?

A. Well, that is the direction of the vein. No, I will correct that; it is south 50 west.

(Testimony of Cyrus F. Tolman, Jr.)

Q. The course of that footwall is shown as what?
[581—536]

A. About south 40 west for the footwall.

Q. And that continues for a considerable distance there with that strike?

A. No, it goes right along there.

Q. Let us take from the point where I lay my pointer now, and take the strike southerly from there.

A. Well, I did not take the strike in there.

Q. Well, you can tell it on the map.

A. I can give it as it is shown here, if you want that.

Q. I would like to have you do that.

A. That is practically south 7 west.

Q. And it continues in that course about how far?

A. Well, apparently I should presume here—I haven't examined this part of the vein in the country rock.

Q. That is the southern part of the vein that you have not examined?

A. From this portion here on I examined this here. This is simply a projection across here.

Q. Just give us the course.

A. I have given you the course to the Ontario workings. That is apparently the Silver King tunnel. [582—537]

Q. Through the Gray, what is the course?

A. I examined it in there, but the vein is marked by a line of stopes, and I took it to be approximately the line of the workings there.

Q. That would be approximately south 24 west?

(Testimony of Cyrus F. Tolman, Jr.)

A. I presume it is something like that, 24 or 25.

Q. For how many hundred feet does that strike continue?

A. That strike seems to continue for 280 feet.

Q. There you encounter a small fault between that and the May drift?

A. That fault is reported there and I have no doubt it exists, but I did not study it; I could not get in.

Q. You saw the May ore body?

A. I saw the May ore body, but I could not get in there.

Q. What is the course of that ore body?

A. Approximately as shown in the working there?

Q. About south 24 or 25 west, perhaps a little more than that?

A. As I take it here, it seems to be about south 35, west.

Q. And that continues for approximately a little over 100 feet in length in that level? [583—538]

A. I could not say without measuring. I have not seen the full continuation of that, but assuming that that is the length of the drift there, as I suppose it is, it is approximately 100 feet.

Q. Then you encounter the No. 11 fault?

A. That is the name that it has been called by, I believe.

Q. And on the other side of the No. 11 fault you encounter the Frank ore body?

A. Which is approximately a parallel, as it looks, to the May ore body.

(Testimony of Cyrus F. Tolman, Jr.)

Q. And which continues for how many hundreds of feet on that course?

A. I could not say; I do not see the end of the workings here.

Q. Well, you can take Exhibit No. 1 perhaps; that shows the length of the working?

A. Yes, that is approximately the end of the workings; it is approximately 200 feet.

Q. Is that cut off on its southern end, or is the vein still continuing upon its course as you saw it disclosed in the southern face of that working?

[584—539] A. I did not see it go on there.

Q. You have no reason to believe that it does not continue indefinitely or for a considerable distance beyond?

A. I don't know; I have no reason to think it is cut off, but how far it would continue I could not possibly say.

Q. Now, let us go back to this map again, and let us find on the 400 foot level, Plaintiff's Exhibit 14, what is the course of the vein from station 2181?

A. I could not tell you. The whole vein is a brecciated mass in there, and there are no definite structural features at that point to measure.

Q. I will place my pointer on the vein as shown on Exhibit 14, at a place just above where the shaft is shown passing under the hanging-wall there. What is the course of the vein for 50 feet from there in a southerly direction?

A. If I give that I would have to scale it from these maps, which are not my maps, and I could

(Testimony of Cyrus F. Tolman, Jr.)

hardly testify to that.

Q. You do not question their accuracy?

A. I do not question them, but I can only give it from that map.

Q. Then give it to me from that map.

A. Yes. From this map at that point I should say the [585—540] strike is due south.

Q. For some distance?

A. Well, it is due south there, I presume, for at least 50 feet in that place, and then it is practically south generally as far as shown, or apparently a little to the west.

Q. Take the hanging-wall of the vein as disclosed upon this level. What is the course of that for the first 50 feet in a southerly direction from the Osborne fault as disclosed upon Exhibit 14?

A. That is not open. I have never taken a course anywhere except where I could see it. I can give it to you from this projection.

Q. Yes, that is what I mean.

A. South 50 west.

Q. Then it continues down?

A. It turns a little to the southerly.

Q. About south 30 or 40 west?

A. I should think so, coming down here southerly and then turning slightly to the southwest.

Q. There is some flattening of the vein there, is there?

A. Oh, yes, of course that vein is flat out through there. [586—541]

Q. You can take little stretches of 50 feet here and

(Testimony of Cyrus F. Tolman, Jr.)

there and get almost any strike on that level, can't you?

A. You could if you measured it by taking the map projection and measuring it in the middle of the country rock, yes, but that is not the way it is usually done.

Q. Is it usual, as far as your practice and experience goes, in determining the strike or course of a vein, to take some local course or strike that you may find for 50 feet where the vein has been developed on that level for hundreds and hundreds of feet?

A. Why, yes, I think so; if you take but the 50 feet, it is.

Q. And say from that local strike that you get in that 50 feet, that the strike of the vein is as disclosed there? A. Certainly, for that 50 feet, yes.

Q. You did not intend to be understood in your testimony as saying to the Court that the strike of the vein was as given by you?

A. No, by no means. The vein curves, and you can no more say that—it would be as foolish as if I had said that the strike of a circle was anything definite. I selected a special portion of the vein to investigate. [587—542]

Q. And that portion was within 50 feet of the Osborn fault? A. Yes.

Q. How far from the line of the fault on that level was the point at which you were furthest away from the fault in taking that course?

A. In that lower course there it was quite close; I

(Testimony of Cyrus F. Tolman, Jr.)

should say ten feet; that the furthest distance would be 10 or 15 feet.

Q. In other words, you took the course along the fault, the course of the vein along the fault?

A. Yes, but I took the strike of the vein, not the strike of the fault. I did not take the intersection.

Q. I understand that, and in taking that strike you did not get away from the fault over about 8 or 10 feet on that level?

A. No, not on that level. [588—543]

Q. You concede, of course, that the vein has been affected for some short distance from the fault by the fault?

A. Well, I do not know; it has been twisted, but whether that has been done by the fault or not would require a definition of what the fault was.

Q. With your experience in the study of faults would you consider that the rock masses on the southern side of the Osborne fault could have moved against that fault more than a mile without affecting the rocks for some little distance away from the fault?

A. I think probably the bending or dislocation was done before the break was made. I imagine that the twisting or bending of the vein took place under great pressure, and then finally there was a break or a relief, a slip, and I doubt very much if the bending is due to the movement of that fault.

Q. Just read the Professor my question now, please.

(Question read.)

(Testimony of Cyrus F. Tolman, Jr.)

A. No, I would not.

Q. Take the 300 and just show the Court over here where you took that course—back of the vein on the 300 [589—544] level, where you say you got a course of south 88 degrees west?

A. That is correct, south 88 degrees west.

Q. Where did you get that?

A. The structure of the ore body shows very well up in this stope, a little bit above point 2528. The strike of the vein from that point 2528 over to the Osborne fault by examining the vein at that point and the footwall was as I gave it.

Q. For how long a distance did the vein have that?

A. I have already stated approximately fifty feet.

Q. And that course for fifty feet? A. Yes, sir.

Q. How far away did you get from the fault by taking that course, Professor?

A. I would say about fifteen feet.

Q. About fifteen feet? A. Yes, sir.

Q. Will you look at Plaintiff's Exhibit 13 and indicate to the Court on that plan map where it was that you took that course?

A. There is a station at the point where the end [590—545] line of the Senator Stewart Fraction claim is shown; it was about from that station to the east, I do not see any other points of reference. That station is how far south of the Osborne fault?

A. That station right there is very close.

Q. Within two or three feet, isn't it?

A. Well, not quite that close, I don't think; perhaps five feet; perhaps three feet.

(Testimony of Cyrus F. Tolman, Jr.)

Q. Yes, sir; and you took it from there along to the point where the vein is last disclosed in that—

A. After I took a sight down here I could see the footwall of the vein very well on account of the structure, and you can see through the stopes, and I tried to get the average as close as I could for the last fifty feet of the vein in that fault.

Q. It was parallel approximately to the fault there?

A. No, the strike is not parallel; it is 22 degrees from the fault.

Q. The point most easterly which you took in connection with the station was right up against the fault, wasn't it?

A. It must have been very close to the fault; I [591—546] could not say it was right together, but whatever place it was at the point that I could see the back of the vein before from looking in that direction.

Q. In other words, you started at a point five feet away from the fault and took a course down to where you last find the vein on that level against the fault; that is stating it correctly, isn't it?

A. Well, I did not confine myself to that. In that direction I took as many sights as I could in there; I could not say that my only sight was within five feet.

Q. The course that you have given me, you said you took from this point where the station is to that point in that little—

A. Well, it is approximately that, yes. I did not see the stations.

(Testimony of Cyrus F. Tolman, Jr.)

Q. Did you attempt to secure the sight of the vein on its course for hundreds of feet southerly on that?

A. You can get that from the workings of the 300; you could not get it from the structural feature of it, you could not get the strikes in here, but you can take them from the workings.

Q. I do not care about that. We find that this section [592—547] 4 on Exhibit 13 passes approximately along the course of that vein, does it not? A. Well, no, I would not say.

Q. How far along the Osborne fault from the place where the vein is last shown in a westerly direction does that section cross the fault, along the line of fault? A. On this section?

Q. Yes. A. From the vein of the fault?

Q. No, sir, along the fault where it is—

A. Ninety-five feet.

Q. That passes through away to the south hundreds of feet from there the ore bodies in the Gray?

A. Yes, sir; I think this is the Gray.

Q. And in that distance of approximately 700 feet the vein has only departed, the hanging-wall of the vein, ninety and ninety-five feet from the line of that section, hasn't it—the footwall of the vein, I should say, Professor?

A. I think this is the greatest displacement in that line.

Q. On the Osborn fault? [593—548]

A. Yes, sir.

Q. You did not take the courses elsewhere along those workings which were open for hundreds and

(Testimony of Cyrus F. Tolman, Jr.)

hundreds of feet, did you?

A. The course is shown so well by the working in here that it would be unnecessary; it is not complicated by a question of intersection with a fault. You do not study to get the true directions the way you would at that other point. You just go to the workings and see the way they are driven out on the ore, the way the miners work there.

Q. And they are driven out on what course, those workings?

A. The workings of the Gray ore body, I believe it is called there—

Q. Yes, sir.

A. About south 30 west.

Q. On the 200 level where was it that this course of south—

A. The same conditions that I have described.

Q. That the course followed as cut off from the fault? A. No, sir.

Q. How far away did you get from it this time?
[594—549]

A. It does not matter how far I get away from it, but the vein has a definite direction and the intersection another; I took the direction of the vein within the last fifty feet.

Q. Just point out to his Honor on the map where you did that.

A. I got a very good sight from a little raise on the 200 foot level. At the bottom part of this raise 218 east, and the dip of the vein or the strike of the vein was taken in and would not govern the direction of

(Testimony of Cyrus F. Tolman, Jr.)

the ore more than a short distance west of that raise.

Q. Now, Professor, you say right at the bottom of that raise. Now then, from what point to what point?

A. I took from where you can see the ore in the raise and took my sight in the direction the ore extends. I did not see the—

Q. You did not take it then on the level?

A. I took the sight on the level, yes, sir; I simply saw what direction the ore was going and put it down.

Q. Did you see up in the raise?

A. No; you can see the ore not clear up in the [595—550] raise, but you can see the direction of the ore in the raise, and I have that marked as the point in which I took that direction.

Q. The fact is that the foot of that ore along that raise is disclosed as the Osborne fault?

A. Yes, sir; the Osborne fault comes back of that; you can see it.

Q. It is in the drift here just as Mr. Clancy marked it in blue on that map?

A. It crosses there down on the level, but you can get up a few steps and get the ore.

Q. For what distance was this ore up in that raise exposed, this vein that you took the course, how wide is the raise? A. How far up the raise?

Q. Yes, sir; how far up the raise was it where you took the sight?

A. The ore goes up eight sets in that raise, approximately.

Q. Where was it you took this sight, how far up

(Testimony of Cyrus F. Tolman, Jr.)

this set where you saw the course of the ore?

A. I did not mark the number of sets up; I think [596—551] it was about two or three, where you can see that ore very well in there, see the structure.

Q. Yes, sir; and that is for how far, how wide is the raise?

A. That would govern for the direction in here, because you can get a very good strike on the vein right in the drift there.

Q. Yes, sir, and that is what?

A. The average of that on the 300 foot level is north seventy west.

Q. What is the strike of the Osborne fault in there?

A. No, I beg your pardon, it is south, eighty west, the Osborne fault is.

Q. Didn't you give it south 76 west in your testimony this morning? A. On the 300 foot level?

Q. On the 200.

A. Oh, I beg your pardon. It is south 76 west. That is correct.

Q. What is the course of the Osborne fault there?

A. North 80 west.

Q. And you took that only for fifty feet and again [597—552] disregarded the hundreds of feet of opening upon this vein upon its course?

A. No, I did not disregard it; I saw the vein going out in its course.

Q. That is approximately on its course?

A. Yes, sir, with the workings that have been testified to.

(Testimony of Cyrus F. Tolman, Jr.)

Q. Yes, sir; and the same is true on the Stewart tunnel level, you saw it out for a distance along the place of the fault.

A. The distance I should say would not hold more than for a distance of fifty feet.

Q. How far away from the fault did you go in getting that course?

A. About the same, about three or four or five feet, approximately.

Q. And in giving the course you only took that into consideration and did not give any consideration to the hundreds and hundreds—

A. I gave it consideration, yes, sir; that only gives the strike up in this direction here; this is just as important if one is studying the strike here, but the [598—553] strike changes, and I simply took a certain part of the strike to study.

Q. The Stewart tunnel level discloses for hundreds of feet the course of the vein on the highest level—

A. Yes, sir.

Q. Approximately north 30 east and south 30 west, does it not?

A. Yes, sir.

Q. Let us go to the Apex drift.

A. Yes, sir.

Q. Where is the Osborne fault disclosed in the working, this easterly working of the apex—

A. Approximately at a point marked 2502, a little north of that.

Q. Would you mind taking a blue pencil and mark that on there, Professor, as accurately as you can, how it is shown and the course it crosses there?

(Testimony of Cyrus F. Tolman, Jr.)

A. Something like that (indicating).

Q. That is the blue line under the "W" and just over station No. 2502 that you gave? A. Yes, sir.

Q. Where did you take the strike of the vein in that? [599—554]

A. The vein. This is the fault that I put on there.

Q. I understand, but I have gone to another question now. You said you took the strike of the vein in there.

A. Well, here, the strike of the vein I took along the footwall—

Q. Of the Apex drift?

A. Of the Apex drift, yes, sir.

Q. And what did you say that is along there?

A. South 83 west.

Q. Just to what point now did you take it, from what point to what point?

A. From a point a little north of 2502 to a point approximately five feet north of 2117.

Q. You say, Professor, that that vein is disclosed throughout that entire distance?

A. Yes, sir, the vein is, certainly.

Q. The vein is disclosed there? A. Yes, sir.

Q. The footwall of the vein all the way?

A. I think so, yes, the footwall shows coming up on its apex, and the drift was driven along the footwall of the vein. I saw it numerous times while it was driven [600—555] and watched the fracture very carefully to be sure that was along the footwall.

Q. I want to go back again just for a moment to the stopes that are immediately above the Fir tunnel

(Testimony of Cyrus F. Tolman, Jr.)

level, immediately above this little working that runs out along the Osborne fault—above the Fir tunnel level—would you be good enough to give me the course of those stopes as shown upon Exhibit 2?

A. I have not the strike in the stopes, but I can give you the direction of this line here which shows. Taking this line through here—south 52.

Q. Those are immediately over the place where you got this— A. Yes, sir.

Q. Immediately over the place where you got this course of south 80?

A. I don't know whether the real structure of the vein there—whether that is the strike of the vein or simply the strike of that line on the stopes there.

Q. The miner usually follows the vein as he finds it?

A. In an irregular ore body I should imagine he could open the stope up in any shape, and I would not see why [601—556] the stope would show the direction of the strike in an irregular ore body.

Q. They do in that mine, though, don't they?

A. I suppose in some places; they certainly do not here. They swing around that way (indicating). Those stopes could be opened up in any way as far as possibility goes, the way the stoping is done they run out as far as there is ore.

Q. Now, Professor, taking the Frank and the Gray ore bodies, their course is approximately south 40, did I understand you to say?

Mr. DINES.—Directing it to Exhibit 2?

Mr. GRAY.—On any of the exhibits.

(Testimony of Cyrus F. Tolman, Jr.)

A. I gave you that course; I could do it again. South forty west as I remember it, something like that.

Q. Between thirty and forty. And the dip is what? A. I did not take the dip there, but—

Q. Didn't you take the dip in those ore bodies of the vein?

A. No; it is shown by the stopes; you can calculate it better.

Q. It would be approximately what?

A. Well, just to guess, I should say about sixty [602—557] degrees, something like that.

Q. Did you go up from those workings to the Stewart tunnel level and up along that until you came to what has been marked here the apex of the ore body as it crosses the Senator Stewart claim?

A. Yes, I have been up through those workings. I went up those workings twice, I think. I went up—I don't remember now which ore body you spoke of—this ore body or this ore body.

Q. I will take the Frank as you wish.

A. Yes, sir.

Q. You can do the same thing, I presume with the Gray, can you not, by taking a little different course?

A. Yes, sir, you can by taking a little different course.

Q. You would follow right up through, raising all the time until you come to what is marked the apex across the Senator Stewart claim, do you not?

A. Well, yes, you can get up there if you go the right way.

Mr. GRAY.—That is all.

Witness excused. [603—558]

[Testimony of W. Clayton Miller, for Plaintiff.]

W. CLAYTON MILLER, called as a witness on behalf of the plaintiff, being first duly sworn, testified as follows:

Direct Examination.

(By Mr. GUNN.)

Q. Your name is— A. W. Clayton Miller.

Q. W. Clayton Miller. Where do you reside?

A. Spokane, Washington.

Q. You are a mining engineer by profession?

A. I am.

Q. What training or education did you have to qualify you for your profession?

A. I graduated in the University of Michigan in 1881, taking all of the mining courses, studies, then given; there was no mining degree given at that time in that university, and I began my mining experience proper in the fall of 1885.

Q. How constantly have you followed your profession since you finished the course in the University of Michigan? [604—559]

A. I did not follow mining particularly, except incidentally, up to 1885. From 1885 until the present time continuously.

Q. In what parts of the United States?

A. I have examined mines and investigated conditions in British Columbia and all of the western States, that is, in California and Oregon, and Montana and Idaho and Nevada and British Columbia

(Testimony of W. Clayton Miller.)

principally, some in Michigan in the early days.

Q. And in Idaho?

A. Idaho practically continuously since 1885, although for ten years I was in general practice throughout the general western country.

Q. And your experience has been principally that of quartz mining? A. Principally, yes.

Q. And how long have you been acquainted with the district known as the Coeur d'Alene mining district in Idaho?

A. The south side of the Coeur d'Alene district, the quartz district over here, since 1886.

Q. Have you been connected with the operation of [605—560] any properties in this district, and if so, what properties and for how long?

A. I have been connected directly with the management of property since 1893 both in the Wardner district and Mullan district and in the Canyon Creek district, also operated prospects for development in other sections of the district.

Q. And in what capacity has your connection been?

A. From consulting engineer to assistant manager and general manager.

Q. You are acquainted with the property involved in this litigation? A. I am.

Q. Have you examined and studied this property with a view of enabling you to testify in this case?

A. I have.

Q. I wish you would turn, if you will, please, to plaintiff's map Exhibit 1, and state generally the

(Testimony of W. Clayton Miller.)

workings embraced in the examination and study you have made.

A. I have examined the workings on the Stewart vein proper from what is called the apex workings on the northerly portion of the Senator Stewart Fraction down through the various workings to the Fir tunnel and down [606—561] through the various workings also to the Frank and May and Gray ore bodies in the Ontario in controversy herein. I have passed from the Fir tunnel upwards to the apex workings mentioned, passing along the various raises and stopes and up the raise 4 east to where it broke through to the surface and where it showed the top of the vein and apex of the vein at that point some short distance below the surface timbers.

Q. Have you followed and examined the workings in a southerly direction from along the line that you have described into the workings beneath the Ontario? A. I have.

Q. Directing your attention to the workings which you have examined and studied, that is, workings on what has been referred to in the testimony as the Stewart vein, easterly of a line at right angles to the south side line of the Senator Stewart Fraction drawn through the top of raise No. 2, and I will ask you how many veins you find disclosed in those workings? A. I have found one vein.

Q. And then, as I understand, the workings in the Ontario and the workings beneath the Stewart property are [607—562] upon the same vein?

A. They are.

(Testimony of W. Clayton Miller.)

Q. What evidence is there that satisfies your mind that the ore bodies in the Ontario are on the same vein or part of the same vein as the ore bodies in the Senator Stewart Fraction claim?

A. For the reason that you can pass from above to the two ore bodies in the Ontario down on ore and on vein, on the one vein, or you can pass from either one of those two ore bodies in the Ontario upwards to the Stewart vein, to where the two fractions or portions of the vein below join above, somewhere above—about forty feet above the three hundred foot level.

Q. Attention has been called to a fault displacing the Frank ore body from *what has* mentioned in the testimony as the Gray ore body and referred to as the No. 11 fault?

A. That is the 200 foot level, I should have stated. What is your question now?

Q. I say, attention has been called to a fault referred to as the No. 11 fault displacing between the Gray ore body and the Frank ore body all that go under that westerly? [608—563]

A. That is what I was referring to you could pass around in two ways from one ore body and from the other ore body to where the vein was unseparated above the 200 foot level.

Q. What have you to say regarding any connections on ore between the vein disclosed in the Senator Stewart Fraction claim along the line that you have described and the ore bodies in the Ontario?

A. You can pass continuously through drift and raise or winds and stope from the northeasterly por-

(Testimony of W. Clayton Miller.)

tion of the vein as shown in the Senator Stewart Fraction downward and into the ore bodies in question in the Ontario.

Q. Are you able to locate the apex of this ore body with reference to the surface lines of the Senator Stewart Fraction claim? A. Yes.

Q. Please point it out along on the map, if you will, or referring to any of the maps in evidence here.

A. Down the westerly portion of the Apex drift at a point marked therein as "W-2" I have only seen the top of the vein, apex of the vein, at two points, namely at that point at the point of raise 2 west where it comes up under [609—564] and is terminated by the fault called the Clancy fault. Thence going on easterly the top or apex of the vein is discovered at a point just under the top of raise No. 4 east and going on easterly again the Apex drift which follows the footwall portion of the vein encounters the Osborne fault at a point marked on this Exhibit 1 as "W-prime." There the drift turns sharply to the right and leaves the Osborne fault. Thence you can follow down on the vein through raise 4 and easterly along what is called east No. 3 on this map until we encounter the top of raise 218 east. Just before we reach the top of that raise in this east drift the ore and vein disappears underneath the floor of that level and cuts diagonally across the angle as indicated on this map and follows down this raise, the ore at one time going beyond and to the northeast a little of this raise on account of

(Testimony of W. Clayton Miller.)

this bend. As we follow down under this fault there or along the fault, it is not under the fault, the apex of the vein in the top leaves this raise just prior to reaching the 200 foot level, and again cuts upon it to the southeastwardly and follows along above the 200 foot level, and is next seen some forty or forty-five feet [610—565] as I recollect it, down raise 314 east, this raise starting on the 200 foot level and following down the Osborne fault, which at that point is quite steep. This raise follows down into the stopes—into the 300 foot level where the apex of the top of the vein under the fault again breaks sharply to the right, in a curve to the right, and is seen next at a point about twenty feet westerly of the east breast of the east 300 foot drift. Where it is next seen is on the Fir tunnel level, below that on the easterly drift almost directly underneath this point and near the breast of that east drift, I cannot read those survey numbers.

Q. What, if any, difference is there in the structural features of the vein as it is disclosed along this line of apex that you have described and the structural features of the vein beneath the Stewart in the Ontario to the south?

A. There are no differences that I can see. [611—566]

Q. You spoke about the vein terminating along the fault; what fault do you refer to?

A. In the easterly portion I have reference to the Osborne fault.

Q. Now, from your examination, are you able to

(Testimony of W. Clayton Miller.)

say whether or not the ore bodies or the section of the vein underneath the Ontario is on a higher or on a lower plane than the apex of this vein as you have described it in the Senator Stewart Fraction claim?

A. The vein or apex that I have described has a downward course into the ore bodies in the Ontario claim.

Q. On what lines with reference to the end line of the Senator Stewart Fraction claim?

A. Parallel or roughly parallel to the easterly end line.

Q. I want to direct your attention here to the model introduced in evidence as Plaintiff's Exhibit No. 15-A, and ask you whether or not that represents the situation of the vein with reference to the apex and the Osborne fault, approximately, as you have observed it in the ground?

A. I have not checked that model, but it has all the appearance of illustrating the facts as they exist and as I [612—567] saw them.

Cross-examination.

(By Mr. FOLSOM.)

Q. Mr. Miller, in starting from the Frank ore body, what direction would you go to reach the highest point of the upper edge of the vein?

A. The highest point as shown here?

Q. Yes. I don't mean through the workings; just indicate with your pointer.

A. Well, you would follow the raise up to the west end of the 300 foot level, and then shortly to the east of that there is another raise going up to the 200 foot

(Testimony of W. Clayton Miller.)

level, and from thence some short distance east of that there is a raise No. 223 west, which goes continuously up to the old lower Stewart tunnel.

Q. Indicate on the map.

A. That is the way that I traveled at one time—and then easterly, the main workings along west of the shaft on the old 200 foot level are caved, and it is necessary, therefore, to go to the northerly branch of the old 200 foot level to get to the apex raise. [613—568]

Q. As a matter of fact the general course of the vein is as testified, north 30 east, is it not, except in the immediate vicinity of the Osborn fault?

A. As the vein traverses northeasterly from the south side line of the Senator Stewart Fraction it runs roughly north 30 east until it begins to curve easterly or southeasterly.

Q. What distance from the Osborn fault does it begin to curve on the old lower Stewart tunnel level?

A. My recollection is about 120 feet.

Q. Southerly from the fault?

A. Southwesterly.

Q. The curve is not very great, is it, until you get in the immediate vicinity of the fault?

A. Until you get close to the Deering crosscut I think it is called, the effect of the curve is not particularly noticeable.

Q. In going westerly from the Frank and May ore bodies, you are constantly climbing, or going upward, are you not? A. You mean westerly?

Q. Westerly or northwesterly?

(Testimony of W. Clayton Miller.)

A. Oh. Yes, sir.

Q. In going northeasterly in the direction of the east [614—569] end line you travel practically on a level, do you not, for about 800 feet?

A. From the top of the Frank ore body you travel easterly, northeasterly to reach one point of the apex.

Q. I am not asking about the apex. I say, you travel practically on a level until you get within a short distance of the point that you call the apex crossing the east end line of the Stewart Fraction?

A. Well, you can travel along the 300 foot level, yes.

Q. You can travel on the level for practically 800 feet?

A. The level itself has only naturally a water drainage, if that.

Q. Does that level correspond practically with the course of the vein for this distance; substantially, I mean? A. Substantially.

Redirect Examination.

(By Mr. GUNN.)

Q. Mr. Miller, calling your attention to Plaintiff's Exhibit No. 2 and the stopes as shown upon that map, I will ask you whether or not those stopes indicate to any extent [615—570] the turning or curvature of the vein as it goes toward the fault?

A. It shows it very markedly on the 200 and 300 foot levels from the points north and east of the south side line of the Stewart Fraction.

Q. I will ask you whether or not the 300 level to which your attention was directed by Mr. Folsom

(Testimony of W. Clayton Miller.)

is parallel to the end line of the Senator Stewart Fraction claim? A. No.

Q. And what is the course of that level with reference to the line of the cross-sections No. 4 and No. 6?

A. It is more southwesterly.

Q. And forms an angle with the line of those cross-sections? A. It does.

Witness excused. [616—571]

[Testimony of William Beaudry, for Plaintiff.]

WILLIAM BEAUDRY, after being duly sworn as a witness for plaintiff, testified as follows:

Direct Examination.

(By Mr. DINES.)

Q. Please state your full name, residence and occupation.

A. William A. Beaudry, occupation superintendent of the Stewart Mining Company; residence Kellogg.

Q. How long have you been superintendent of the Stewart Mining Company?

A. About two years and one month; two years the 1st of January.

Q. That is the 1st of this present January?

A. Yes.

Q. Then you went there in January, 1910?

A. I was employed by the Stewart Company prior to that time as foreman.

Q. Were you employed by the Stewart Mining Company prior to that time that you became superintendent?

(Testimony of William Beaudry.)

A. I was, as foreman, for approximately seven or eight months. [617—572]

Q. And what mining operations have you been superintendent of during the period of time that you have named, two years?

A. Well, approximately all the workings below the old lower Stewart tunnel level, and a part of that.

Q. Prior to your becoming superintendent, what capacity did you serve in? A. As foreman.

Q. Of the same property, the property that is involved here in this litigation?

A. The same property.

Q. How long were you foreman?

A. From April, 1910, until January, 1911.

Q. What experience had you had before your employment with the Stewart Mining Company, in conducting underground mining operations?

A. I was employed as a timberman for approximately one year.

Q. With the same company?

A. With the same company.

Q. Prior to that time had you had any experience in mining?

A. I had no experience prior to that. [618—573]

Q. How long—what period of time—

A. I will correct that. You see the company's mines closed down for approximately two years and a half, and so that year that I had reference to was the year before they closed down, so that was approximately in 1906 or 1907, I believe.

Q. How many years altogether have you known of

(Testimony of William Beaudry.)

the mining operations conducted in the Senator Stewart Fraction, the Senator Stewart lode mining claims? A. I think about since November, 1906.

Q. Do you remember how much development work had been done upon the Senator Stewart Fraction claim at the time you first were employed there? A. I do.

Q. Please state to the Court briefly and in a general way what were the conditions in 1906 when your employment began.

A. The lower Stewart tunnel level was complete to a point between survey point 9511 and survey point 9512 on what was called at that time the south cross-cut, and to the point between 9545 and 9546 in what was known as the Deering crosscut, and to a point between 9536 and 9537 in what [619—574] is known as drift No. 2, old Stewart tunnel level, and at the point 2102 in drift No. 1 east. The old Stewart tunnel level was approximately to point 2106 in drift No. 2 west, lower Stewart tunnel level, and there was some work done in what was known as the Samuels raise; there was some crosscutting done on the 85 foot level, and there was some work done on what is known as the 180 foot level in the same raise, and almost all that upper Stewart level was complete at that time, all except a few feet, probably that has been done since, and all the rest of the work I believe has been done since I have been acquainted with the Stewart Mining Company.

Q. Were you at work on that when any work was done in this drift No. 1 east and drift No. 2 east?

(Testimony of William Beaudry.)

A. Well, I was not acquainted with it, you might say, hardly any of this work in the drift No. 1 till that point I mentioned, I believe, point 2102.

Q. Was any of this stoping work done on what is designated as the 35 level in the westerly workings?

A. There was some work done on that.

Q. What was the general direction of the vein that is shown in the stoping on the 35 foot level; what was its [620—575] general course?

A. Its general course was approximately east and west.

Q. And what was its dip?

A. Its dip varies from I believe on the west end here—it was pretty hard to get a true dip, and it was very flat, but going easterly in some places it was almost vertical, and from that to 45, southerly.

Q. Now, please state to the Court whether or not the workings on the level indicated as the 35 foot level, and the drift No. 2 west and No. 1 east, shown in the westerly part of the Senator Stewart Fraction, were on the same vein that the workings in the easterly part and covered by a line drawn parallel to the end line through the point “W” east on Exhibit 1.

A. There is no connection; nothing to show that they are.

Q. Was there any work done during the time that you were employed there to see if those veins were the same?

A. There was some work done in the top of these stopes here, some crosscutting and prospecting.

(Testimony of William Beaudry.)

Q. What did the crosscuts that you drove show, and how did you drive them? [621—576]

A. We drive crosscuts out different ways in the top of the stopes above old lower Stewart tunnel level, and we never found anything in any of them.

Q. How about the old lower Stewart tunnel level itself? Was that a crosscut?

A. That was a crosscut. Deering crosscut was a crosscut.

Q. What was shown in the Deering crosscut?

A. Where I have seen that Deering crosscut it was practically in barren country rock.

Q. What was shown in the upper Stewart level?

A. In the upper Stewart tunnel level was country rock till it got within—well, where I have seen it, it was in country rock, except that they had some ore up above about point 9566 to 9564, I believe, and also easterly—well, I should say between 9567 and 9569.

Q. Now, what was shown down in here to the southerly of the western workings to which I have just directed your attention?

A. Southerly on that upper Stewart tunnel level is shown a heavy gouge, which was called a fault, and I believe it has been known by some people or called the Ontario fault.

Q. Was there any stoping done in this southern portion [622—577] up against that gouge or fault as you have designated it?

A. There was; from the old lower Stewart tunnel level a stope was run a little easterly of what was known as No. 10 raise; the stope was run till it ter-

(Testimony of William Beaudry.)

minated against this Ontario fault.

Q. How did the vein terminate there; did it lie over on the fault or did it come down under the fault? A. It came down under the fault.

Q. Where your stoping was done—what was the dip of the fault at that place?

A. I don't know; I never took no dip of it. It dipped westerly.

Q. I call your attention to the stope map, Plaintiff's Exhibit 2. Are these the stopes that you referred to? A. They are.

Q. Now, please explain to the Court whether that ore lay up over the fault or whether the fault dipped the other way and the ore was stoped up under the fault—I am referring to the stope on Exhibit No. 2 immediately above the most southerly point or face of the old lower Stewart tunnel.

A. The stopes terminated under the Ontario fault and [623—578] very nearly Plaintiff's Exhibit No. 2 shows the cut of the ore almost as it was according to my recollection. You can see there that there was probably five feet or so on every floor, which is approximately seven feet of a raise, that the stopes went northeasterly.

Q. Now, directing your attention to the workings that are shown easterly of the line to which I call your attention, please state on what veins those workings are made and driven.

A. The workings were driven on what is known as the Stewart vein.

Q. Are you familiar with the workings in the On-

(Testimony of William Beaudry.)

tario claim as shown on Exhibit 1? A. I am.

Q. What bodies of ore have been developed underneath the Ontario and extracted?

A. There has been a stope called the Gray stope extracted from the Silver King tunnel level above what is known as the Gray drift; the ore has been extracted to the 300 foot level of the Senator Stewart, and the Frank ore body, that is southwest of the Gray ore body, has been extracted also to a level with the 300 of the Senator Stewart. [624—579]

Q. To what vein, if any, do those ore bodies under the Ontario surface belong?

A. To one vein, to that of the Stewart vein.

Q. How do you know that they are a part of the Stewart vein?

A. By different work that has been done upward on that vein, which leads to the Stewart vein.

Q. Do you know where the top or apex of the Stewart vein as it approaches nearest to the surface of the ground lies within the boundaries of the Senator Stewart Fraction claim? A. I do.

Q. Please designate to the Court the topmost portion of that vein.

A. The topmost portion or highest portion of that vein is shown about between 20 and 30 feet below the collar or top of the apex raise, about 35 or 40 feet above the Apex drift.

Q. Trace it on.

A. Then the top of the vein is shown near point 2532 in the west Apex drift, where it terminates against what is known as the Clancy fault, and the

(Testimony of William Beaudry.)

apex or top of the vein is next shown easterly, between point 2566 and 2502 in the east [625—580] portion of the Apex drift. It is next shown on the old Stewart tunnel level in what is known as the east No. 3 crosscut. It is shown between points 2512 and point 2571, and then it is shown nearly all along that crosscut to a point between survey point 2549 and 2584. Then we see the apex in about 50 feet in what is known as raise No. 218 east, and then we see it continually for a distance of about 20 feet, and then the ore or the vein seems to go above the 218 raise a short distance, due to this curve in the raise here. Then we follow it again for a distance of about, I should say between 80 and 100 feet, and the ore gradually leaves this raise easterly, and we see the top of the vein again at a point approximately 30 feet beyond the bottom of 218 east raise. We see the top of the ore at that point, that is, I have seen it as the drift was being run. We followed the ore as it came up, varying from four feet up in the drift, and gradually kept coming down as we went easterly till to-day, by picking in the bottom of this east drift, 205 east drift, you can disclose the vein, but you can't see it in the top of the drift because it never reached the top. Then we see the apex of this vein in raise No. 314 east. That raise was run on the true dip of [626—581] the vein. I took extra precautions to run that raise myself so that I was sure that it followed the true dip of the vein, and I followed the true dip of the vein up approximately 30 feet till the ore terminated against what is known

(Testimony of William Beaudry.)

as the Osborne fault. All the ore below this raise has practically been stoped at present out almost to the top of the ore. I could draw a line probably from that where the ore is at the present day. It goes to a point probably about 50 feet easterly of raise 314, and then it gradually goes to the bottom of this 300 east drift, the same as it does on the 205 east drift. Then you next see it in the Fir tunnel, or what is called the 415 east drift on the Fir tunnel level, and the ore there is shown in the face of that drift terminated against the Osborne fault at the top; you can see where the pay ore terminates against the Osborne fault; beyond that there will probably be a little vein above that, a little bit, but I would not be prepared to say.

Q. Does the apex follow on around until it crosses the end line of the Senator Stewart Fraction?

A. It follows on around until it crosses the end line of the Senator Stewart Fraction. [627—582]

Q. Point out to the Court what you actually have seen yourself about that.

A. I saw that it crosses the Senator Stewart end line approximately 30 or 40 feet above the 300 foot level.

Q. Can you trace it on easterly until it crosses the side line of the same claim?

A. Easterly the stopes as marked from the old Stewart tunnel level till the vein was so poor that it did not hardly pay to operate, and from the top of that stope numerous raises were run to what is

(Testimony of William Beaudry.)

known as the Clancy fault. There was a raise run between—I think I could refer better to the stope map.

Q. Refer to Plaintiff's Exhibit No. 2 if you prefer.

A. There was a raise run approximately I should say about 150 feet westerly where we last see it in the Apex drift, to what is known as the Clancy fault, but I never got to see that point very clearly, as it was done on the night shift, and when I got there the raise we had run had caved in, as the Clancy fault generally has water, and the rock is very soft around it, and it has sloughed in, and I did not get to see that point, but I saw a point about 150 or 200 feet west of that where I got a good view [628—583] of the Clancy fault, directly above what is known as No. 9 raise. Then we see the top or the apex of the ore in a stope that was run about 30 feet east of the side line of the Senator Stewart Fraction, or the line separating the Senator Stewart Fraction from the Senator Stewart. The Clancy fault was open at that point for a distance of about 20 feet I should judge, and we crossed the Clancy fault at that point for a short distance, probably between 10 and 20 feet, and the rock is very loose, in fact there were crevices on the other side of the Clancy fault that I could shove my arm through, which at that time lead me to believe that I was either near the wash or not very far from the surface.

Q. How far were you in fact, from the surface at that point?

A. We found out after that that that was about 68

(Testimony of William Beaudry.)

Q. How wide is the Stewart vein at that point in the Apex drift?

A. It is pretty hard to say. I know that it is approximately between 40 and 50 feet. I know of 30 feet in different places.

Q. How do you know of 30 feet; what is there there to show you that it is 30 feet at that point?

A. Well, I have worked stopes in places as wide as 60 feet.

Q. What development is there now?

A. There is a crosscut in the Apex drift opposite [632—587] point 2519, turning southerly, which encounters vein material approximately 30 or 35 feet from the hanging to the footwall.

Q. Is that crosscut a crosscut on the vein towards the hanging-wall? A. It is.

Q. Is the hanging-wall disclosed in its face?

A. Not yet.

Q. And what is the entire length of that crosscut?

A. I believe it is 30 feet east; 30 or 35 feet, I forget which.

Q. What is the character of the vein material that you find in that crosscut?

A. Well, it is mostly of a low grade carbonate ore.

Q. Compare it with the character of the vein as you find it at other portions of the top of it exposed, and how do they compare?

A. It is very similar, almost the same. I could not see any great difference between it and in the places that I have seen it.

Q. In driving on the vein to these different points

(Testimony of William Beaudry.)

where you say you came to the apex, did you go up on the natural or true dip, or did you select arbitrary lines to [633—588] go up on from the lower portions of the vein as it lay in the earth to the highest portion?

A. We generally tried to go up on the true dip. Of course sometimes we have to change the direction of it on account of the condition of the ground; if we come to a bunch of ore that is too low grade to mine, we will probably leave it, and it may cause the stope to turn a little more or less.

Q. Now, in such portions of the top of the vein as you find it in immediate contact with the Osborne fault on the east end line, is the vein there oxidized, or is it galena, commercial ore?

A. It is galena, and mostly commercial ore.

Q. Is the vein as you find it against the Clancy fault at the point that you designate where it is against that fault, oxidized, or does it contain galena or commercial ore?

A. The vein between point 2532 and 2543 in the Apex drift shows galena.

Q. And how is it at the point that you find the fault in the upraise No. 2 W, is it oxidized?

A. It is not. [634—589]

Q. What is it, galena there? A. It is galena.

Q. Now, in the other portions of it where you have found the apex not in contact with the fault, you find it oxidized, do you? A. We do.

Q. Were you in actual charge of the underground operations as you were working on the vein and

(Testimony of William Beaudry.)

found the top of it lying against the Osborne fault?

A. I was.

Q. Please point out such portions as you actually conducted those operations, and tell the Court how you went up to that point of the apex and on what angle, and how you know that to be the apex?

A. Well, as we stoped upward from the 400 or Fir tunnel level, we stoped up approximately 30 or 40 feet above the 300 level to where we encountered the apex across the end line of the Senator Stewart Fraction. The ore was—the vein was probably between 10 and 2% or 30 feet in, I should think, and as we got near the Osborne fault at that point it gradually terminated and pinched out against the Osborne fault. As we stoped westerly, about every third—or [635—590] probably every second or third sett we would probably raise one sett further before the ore would terminate against the Osborne fault, and so on, till we got to the 200 foot level, and from there the stopes on the 200 foot level done practically the same thing as we raised upward on the true dip of the vein, about every second or third sett as we went along, we would go one sett higher on the vein, and so on to the 100 foot level; then we worked above the 100 foot level approximately five floors, which would be approximately 28 to 30 feet above the 100 foot level, and at that point there was still low grade ore left in the vein, and some places there was still commercial ore, but not very much of it, and the chutes that we were extracting the ore with practically closed in, and I did not think at that time it

(Testimony of William Beaudry.)

was practical to raise new stopes for the little ore that was left there, but I think the work that has been done since then—that that ore will be eventually stoped continually up to the Osborne fault till we get to the level of the east No. 3 crosscut. In the stopes above the old Stewart tunnel level—I can refer to that better on Exhibit 2—I stoped that continually up to the Apex drift at that point. Of course we never encountered [636—591] the Osborne fault in these stopes, because of that fold which is in the ore which has been referred to before, but the vein was small and thin between these stopes southerly and those northerly so that there is a good area of ground there that probably will, part of it, be stoped yet, but some probably is not rich enough to be worth while to stope. At that point we did not encounter the Osborne fault or come to the Apex drift at that point referred to before between point 2566 and 2507.

Q. Now, I will ask you, Mr. Beaudry, please to look at the model which is designated here as Plaintiff's Exhibit 15-A, and state to the Court whether or not that appears to you as a correct representation of the way the vein rises to what you call its apex and what you call its apex in that model?

A. It does. To my mind it is as good a picture of the ore as I have seen it in the operations of the stopes as I could picture it out, as near as my memory goes the vein is located in that approximate same position against the fault.

Q. Directing your attention again to the model, how did you approach in mining the point that is

(Testimony of William Beaudry.)

shown by my [637—592] pointer on the first glass or cross-section that is shown as the red comes up to the blue at its topmost point, how did you approach that point in your actual mining?

A. We approached it with a drift known as 415 east. At that point the hanging-wall of the pay ore, I believe, from my recollection, was about at the dip of approximately 35 degrees southerly, and the fault, I believe something like 55 or 60, somewhere along there.

Q. Have you mined up to that point shown on there—that is, I will call your attention to the fact that the first cross-section is over here?

A. No, there is no stoping above that floor, no ore above that.

Q. Are you familiar enough with this to identify the different cross-sections? A. I am.

Q. On the model. Take the second cross-section from its face, was there stoping done on that?

A. I would like to have that tracing put over Exhibit 1, so that I could exactly locate that on the map.

Q. This is the tracing referred to, Plaintiff's Exhibit No. 15-B? [638—593]

A. Yes. I have put it on a little too high, but that makes no difference.

Q. I think you will have to change that around. I think that is the dip of the Osborne fault.

A. I never saw this tracing before to-day.

Q. I think you have it just reversed, if my idea is correct.

A. No, that was right the way I had it.

(Testimony of William Beaudry.)

Q. Now, the question I want to ask you about that is, taking the third cross-section of the model, Plaintiff's Exhibit 15-A, if you can recall by reference to Exhibit 15-A and assisted by the cross-section lines on Exhibit 15, how you did the actual mining on that section? A. That is the second plate in there?

Q. No, the third one.

A. The stope was run from the 400 or Fir tunnel level on its upward course to a point approximately about 35 feet above the 300 foot level, and at that point the stopes have not reached the top of the ore yet.

Q. Now, did you go, in mining that in your regular course of mining, upward to the apex or downward? A. We went upward. [639—594]

Q. And how would you go from the points of the line of apex as outlined by you to get to the bodies of ore on this vein in the Ontario? A. Downward.

Q. Now, speaking of that model generally, do you think that that correctly represents it as you have found them in your mining operations in the ground?

A. It does.

Q. It is a fair representation of it?

A. A fair representation as near as I could express it.

Q. On that model state what you understand the red lines and the blue lines to represent.

A. I understand the large blue line to represent the Osborne fault, and the red is the vein as it was mined, and what is left that is not mined. Of course some parts of it is not quite stoped out yet. Those

(Testimony of William Beaudry.)

blue lines in the other direction at the top there, some of them represent the Clancy fault, and there is a few of them, I believe—well, where the plate is cut up here represents the surface of the hill at that point.

Q. And the small blue lines?

A. The Clancy fault. [640—595]

Cross-examination.

(By Mr. GRAY.)

Q. Just point out to the Court the thirty-five level.

A. (Witness indicated on map.)

Q. Did the ore on that level ever reach down to a point on the Stewart tunnel level? A. It did.

Q. Where? A. In drift 2 east.

Q. Just give the place.

A. The commercial ore reached the tunnel level between points 9536 and 9538.

Q. And extended along that drift?

A. The vein reached the tunnel level further west than that, but it was not commercial.

Q. Where?

A. Well, it reached the tunnel level at approximately near point 9535.

Q. Any place else?

A. And there is a seam which I would identify as the vein near point 9505.

Q. Those are the only places?

A. The only places that I have seen.

Q. Now, where is the Samuels raise; point to it; [641—596] it is over there in these workings from the—

A. It starts from the old Stewart tunnel level and

(Testimony of William Beaudry.)

raises up until it reaches the upper Stewart tunnel level.

Q. You run out an intermediate there called the 145.

A. I did not run that; I was there when it was run.

Q. Have you been in all parts of that intermediate?

A. I have.

Q. Did you see any quartz or galena on that level in that intermediate?

A. Which one do you mean—185?

Q. 145.

A. I have taken out some ore from that.

Q. Where through there was there any quartz or galena disclosed?

A. I do not know a point in that level.

Q. Practically throughout the level?

A. Well, it is practically from this point here, I should say to a point where it shows Samuels raise.

Q. From the northern point on the level to the point marked with the red pencil by you? Mark that a little heavier.

A. I want to correct that. There is some places that [642—597] the ore, commercial, did not reach the level; there was ore above that.

Q. Yes, sir; just mark right along there.

Mr. DINES.—I would like to have that identified.

Mr. GRAY.—That is the red line along the 145 level.

Mr. DINES.—What he means to say is it did not show.

A. It did not show in all places on the level, but

(Testimony of William Beaudry.)

there was some ore in different places above that level that I have seen approximately the distance that I made that red line.

Q. And point to the end of the "D 2 E" drift on the old Stewart tunnel level.

A. (Witness indicated.)

Q. Did you ever see a strong gouge near the end of that level?

A. I never saw the end of that level.

Q. Never have? A. No, sir.

Q. How close to the end have you come?

A. I have seen different places along this level, but it seems that this level caved in. I was framing timbers outside. [643—598]

Q. How near to the face of that level did you ever get? A. I have been to point 9539, I believe.

Q. Is there a winze sunk any place from the upper Stewart tunnel which is now accessible?

A. A winze in this—

Q. Any place in that upper Stewart tunnel?

A. There was a short winze above this point.

Q. Mark it.

A. It is between point 9569 and survey point 9570.

Q. About where that little working is running east from the level? A. Yes, sir.

Q. Was there any other winze from that level?

A. There was another winze which was run—which connected with the Samuels raise. As I said before, I made a little error in saying the Samuels raise connected with that upper Stewart tunnel, for it did not; it run up I believe 185 feet, and then it

(Testimony of William Beaudry.)

drifted for a short ways until they come to a winze that was sunk, I am pretty sure, that is the winze right there, between 9568 and 9571.

Q. Was there any other winze? [644—599]

A. I know of no other. I was not there when that work was done. I was just in the winze and that was all, although I have done a little work in the bottom of this Pierce winze down here.

Q. Is there a fault in that mine that you know as the Deering fault?

A. There was a fault, I believe it was called the Deering fault, Mr. Clancy pictured it out to you here.

Q. He has given it the name of the No. 5.

A. I believe so, yes.

Q. Will you please describe the position of the ore in that fault on and immediately above the "D 104 intermediate"?

A. Well, the stopes went up from the 100 foot level and after stoping the vein upwardly to, say, approximately fifty feet, some places a little less, that is, near the crosscut it was less, the vein turned very flat and we followed the vein where it was very flat and then it—

Q. (Interrupting.) That is represented by the green there?

A. It does not show on this map, but it turned flat [645—600] before it got to the green, and turned downward before it got to this green; then that stoping was stopped at that point; then there was a chute they run from—there is a little crosscut here which is not numbered.

(Testimony of William Beaudry.)

Q. On the 100 foot level?

A. On the 100 foot level.

Q. Running about parallel with the shaft?

A. About parallel. There is also a vertical raise under this point.

Q. That is, under point R 100-C.

A. Under point R 100-C; and a chute put into that, and then there was a level cut along this, then they stoped the other way.

Q. Along this, you mean the D 104?

A. Along that intermediate referred to?

Q. Yes, sir.

A. Then the ore was stoped upwardly until it met the other stope; the ore was going up on its southerly course, and then it was stoped the other way on its northwesterly course until it reached the old lower Stewart tunnel level.

Q. Now, point out upon the Exhibit 2 to the Court [646—601] those stopes—just above the 100.

A. These stopes just above the 100 are the ones that went up westerly and stopped at this long stope; there may be some work there that is not practically up to date; Mr. Clancy, I cannot say whether he was there at that time or not, but I think he was. Then these stopes were worked from this direction south-eastwardly until they met that stope there.

Q. That is, the red stope within the green was worked along down until it met the stopes that you had carried up from the hundred foot level?

A. Yes, sir.

Q. How did the fault appear through there? How

(Testimony of William Beaudry.)

did the ore come up to the fault; about where through there did the fault run?

A. I should say that there is a fault runs—there is no point I could identify it.

Q. Does this blue line pretty well represent it that Mr. Clancy has marked? A. Very close.

Q. How did the ore come up to the fault?

A. It just came up and turned. [647—602]

Q. It just came up and turned downward in its course westerly? A. It did.

Q. And then how about coming down to the fault, how did it do?

A. It just laid right on the fault at that point, and then the other ore came right up against it.

Q. Laid level from the fault going westerly from there?

A. I could not say it lay level; it was very irregular; some places it might lay level and some places it might be steeper.

Q. There was some gouge along there, was there?

A. There was some gouge, yes, sir.

Q. Did the ore meet on the east side of that fault the ore coming down on the other side? A. It did.

Q. Did I understand you to say that you endeavored to run your raises on the true dip?

A. Not all of them; some of them was run on the true dip. This raise marked 314; I took extra precautions to run that raise on the true dip of the ore.

Q. It was your endeavor to run all of them on the [648—603] true dip as nearly as you could in your mind?

(Testimony of William Beaudry.)

A. No; some of the raises I would run them so as to make the nearest connection; for instance this raise here was done—

Mr. DINES.—State what that one is.

A. 218 east raise was run for the purpose of saving work or saving some drifting so we would not have to spend more unnecessary money.

Q. How about the other raises throughout the property?

A. The other raises are run practically as the ore happened to be in those places.

Q. On the dip of the vein?

A. Sometimes they were on the dip and sometimes they varied. The dip of the vein is not very regular in any place.

Q. There was a raise I want to ask you about, raise 400 right there south of the shaft; do you know where that is? There was such a raise, wasn't there? It would be right under this 300 working.

A. There is some little raises there at present, but I don't know which one you mean.

Q. Wasn't there a raise that you called the raise 400 [649—604] just south of the shaft shown on the 400 level here?

A. There was a vertical raise at that point run for the purpose of getting the ore down from the 300 foot level; it was run almost vertically until it hit the bottom of what was known as the winze at that time. We were dumping the ore in the winze and hoisting it up to the 200, and when the Fir tunnel was completed to nearly a point under that winze we run the

(Testimony of William Beaudry.)

raise through so we would not have to hoist the ore, so we could gob it down instead of raising it.

Q. Was that raise entirely within the vein?

A. It was in vein material.

Q. The lower portion of it, was that in the vein?

A. It was in the vein.

Q. Can you now recall that?

A. I can recall seeing specks of galena in it.

Mr. GRAY.—That is all.

Witness excused. [650—605]

[Testimony of Fred T. Greene, for Plaintiff.]

FRED T. GREENE, a witness called on behalf of the plaintiff, being first duly sworn, testified as follows:

Direct Examination.

(By Mr. GUNN.)

Q. Your full name, Mr. Greene.

A. Fred T. Greene.

Q. Where do you reside?

A. At Butte, Montana.

Q. Have you a profession, and, if so, what is it?

A. My profession is that of mining engineer and mining geologist.

Q. What education did you have to qualify you for your profession?

A. The full mining engineering course at the School of Mines of Michigan at Houghton, Michigan. I graduated there in 1897 with the degree of Bachelor of Science and Mining Engineering.

Q. What experience have you had since your grad-

(Testimony of Fred T. Greene.)

uation in the line of your profession and in what sections of the country? [651—606]

A. Since that time I have been continuously employed as mining engineer or mining geologist by companies in Butte, in British Colimbia, and for the last six, or, rather, from six years ago until the fall of 1908 I was in the employ of the Great Northern Railway Company and was examining mining properties and mining countries in the northwest. Since September, 1908, I have been in private practice with offices in the city of Butte, Montana.

Q. To what extent have you become familiar or has your experience connected you with the mining operations and mines in the Coeur d'Alene mining district or Wardner district?

A. I came into the Coeur d'Alenes first while I was in the employ of the Anaconda Copper Mining Company, in Butte, Montana, and examined some of the mines here at that time, those around Mullan; later in 1906, after leaving the Anaconda Company I made a general examination of the whole Coeur d'Alene district for the Northern Pacific Railway Company. In 1909, in January, I went with the Federal Mining & Smelting Company and was engaged for them in developing a suit which was then pending with [652—607] the Bunker Hill & Sullivan Company, at Wardner, over certain apex rights that were in contention at that time and continued with them until April, 1910. Since that time I have spent a great deal of time in the Coeur d'Alene district examining mostly all the producing mines and

(Testimony of Fred T. Greene.)

particularly the Stewart and the Caledonia mines.

Q. When did you first become acquainted with the Stewart property?

A. In the spring of 1909, but at that time not in detail, and it was not until the late summer and fall of 1911 that I made a detailed study of the Stewart property and spent several weeks in that study.

Q. And referring you to Plaintiff's Exhibit 1, I will ask you to explain generally the portions of the property and the workings of the property which have come under your observation and study.

A. At the time I—at the time of my first detail examination of the Stewart mine the mine operations were confined to the area above the No. 2 level, and at that time the major portion of the mine was accessible and could be studied in detail. Do you desire me to go into that detail? [653—608]

Q. No. A. In those workings I found a vein—

Q. (Interrupting.) I will ask you a question along that line, Mr. Greene. Has your examination extended to the workings shown upon this map beneath the Ontario claim?

A. Yes. My examination up to the present time includes practically all the areas shown by workings on that map, Plaintiff's Exhibit No. 1.

Q. Will you define a vein, please?

A. A vein is a mass of material within the earth crust which is differentiated from that crust either by boundaries or by a difference in the material contact.

Q. Are there different classes of veins, and if so,

(Testimony of Fred T. Greene.)

how are they classified?

A. There are different classes of veins. The veins known in this Coeur d'Alene district are denominated fissure veins and replacement veins and contact veins.

Q. And what is the distinction between a replacement vein and a fissure vein, or a contact vein?

A. There is also a difference between a fissure vein and a contact vein. [654—609]

Q. Yes, sir.

A. But the difference between a replacement vein and a fissure vein is that in a replacement vein the mineralizing solutions in their course through a more or less porous mass of the earth's crust substitutes all the precious or valuable minerals for the country rock contiguous to this course that the solutions follow. In a fissure vein the vein is characterized as the filling of open spaces in fissures lying with an extended horizontal and vertical plane.

Q. And a contact vein?

A. And a contact vein may partake of both the characteristics of a fissure vein and a replacement vein, is usually along and is along the contact of two rocks, one a plutonic rock and the other possibly also a plutonic rock and a sedimentary rock.

Q. How do you classify this vein that you find in the Stewart property?

A. The Stewart vein is a replacement vein.

Q. Now, directing your attention to the workings on the map, and particularly the workings easterly or southerly of a line at right angles to the south side

(Testimony of Fred T. Greene.)

[655—610] line of the Senator Stewart Fraction claim drawn through the letter “W” on this map, and how many veins are disclosed in those workings?

A. One only.

Q. I wish you would describe generally that vein with reference to its structural features as you have observed it.

A. That vein is a replacement vein whose outlines are very irregular, whose plane is undulatory and in a few places disrupted by a minor fault movement. The vein is practically continuous throughout these workings and is identifiable always as one and the same vein.

Q. How do you identify that section of vein or ore bodies beneath the Ontario with the vein disclosed in the workings beneath the Senator Stewart claim?

A. The ore bodies under the—or from the ore bodies underneath the Ontario the vein can be followed continuously up to and under the Senator Stewart Fraction.

Q. You say the vein can be followed. What have you to say with reference to following ore from the Ontario along a course to the Senator Stewart Fraction? A. The same. [656—611]

Q. Now, I wish you would describe, if you will, the apex of that vein with reference to the surface boundaries of the Senator Stewart Fraction claim.

A. First I would like to use Plaintiff’s Exhibit 3. In the general mining operation of the Stewart mine there were two very distinct boundaries met with on all the levels and in practically all the stopes. The

(Testimony of Fred T. Greene.)

first of these was, in order of history, I believe, to have been the Osborne fault, and it was found at the east end of both the old lower Stewart tunnel level, the 100 level, and later the 200 foot level, but at the time of my first examination on the old lower Stewart tunnel level to the east and the 100 foot level. That defined an eastern boundary to the vein. In the stopes above the old lower Stewart tunnel level a fault was met cutting the vein off very sharply and clearly at the top of these stopes, and no ore was found above that cut-off. That cut-off has been referred to and shown at a point approximately 705 feet westerly from the southeast corner of the Senator Stewart Fraction claim, and that cut-off is traceable to the northeast for 250 feet or thereabouts on a slightly bending arc which has a strike approximately [657—612] north 35 east, I should say. From this northerly point the arc continues to bend to the east, and from there for 140 feet or so the strike is about north 45 east. From that last point the bend increases and the arc followed until the eastern leg of that arc straightens and can be followed down through the mine in a direction approximately south 45 east. The eastern leg of that arc is the top edge of the vein against the Osborne fault. At every point along that arc or along that leg the vein departs from the Osborn fault in a downward direction. That has been traced out and followed very carefully by the various raises and drifts at the east end of the old Stewart tunnel level to the 100, to the 200, the 300, and the Fir tunnel level. Raises

(Testimony of Fred T. Greene.)

have connected this up, definitely placing it as shown on the map, Plaintiff's Exhibit 3.

Q. What, if any, difference is there in the characteristics of the vein as you observed it along the line or the vicinity of this apex and on the lower planes or levels down to the Ontario?

A. I neglected to say that one place the vein comes to the surface and shows the surface outcrop above what [658—613] we call our Apex drift. In that Apex drift the surface conditions prevail and the vein is oxidized and highly leached, and there is very little sulphide ore left there except where it has been protected by some overlying impervious seam. Otherwise the conditions throughout the vein are the same.

Q. Similar. State whether or not the section of the vein beneath the Ontario claim is on a higher or a lower level than the horizontal plane through the apex east and west as you have described it.

A. In every case it is lower; that is, in every case the plane—under the Ontario—is lower than our apex. That is what I understood you to mean.

Q. Yes, sir. I direct your attention to the model, Plaintiff's Exhibit 15-A, and ask you whether or not that is a correct representation of this vein as it is found in the vicinity of the apex and of the Osborne fault as you have observed them in the examination you have made.

A. That is a very careful graphical illustration of the vein as it exists in the Stewart claims to-day.

Q. What have you to say as to its being approxi-

(Testimony of Fred T. Greene.)

mately correct? [659—614] A. It is correct.

Q. Have you made an examination of the stopes near the southerly side line of the Senator Stewart claim and above what is designated on Plaintiff's Exhibit 2 as the old lower Stewart tunnel level?

A. I have.

Q. What, if you know, causes those stopes to terminate as shown upon this map?

A. In a horizontal direction there is nothing that causes those stopes to terminate except the fact that the ore is very lean and is not mineable at a profit.

Q. State whether or not there is a fault found in that vicinity, and if so, what relation that fault has to the stoping.

A. On the 13th floor above this point which you mentioned there is a fault which at that point has a strike of north 17 east and a dip to the southwest of about 43 degrees, or a dip to the northwest, I should say, of about 43 degrees. That is seen and has been designated by myself and named by myself as the Clancy fault, and that cuts off the vein.

Q. Do you find in that locality in the Senator Stewart [660—615] claim a fault which has been referred to in the testimony as the Ontario fault?

A. Yes.

Q. Where is that fault located with reference to the stopes shown on this map above the old lower Stewart tunnel?

A. It is not indicated and it does not show in those stopes anywhere.

Q. Can you point out about where it would be with

(Testimony of Fred T. Greene.)

reference to the surface boundaries of the Senator Stewart claim?

A. Not on this stope map but on Plaintiff's Exhibit 1 the fault lies through station 2571 which is above the stopes outlined on Plaintiff's Exhibit 2.

Q. Is there any ore shown in the face of these stopes as you proceed southward, or the stopes at the end of the ore?

A. There is vein material and some ore which I do not believe is commercial.

Q. At what depth are these ore bodies that are known as the Frank ore bodies beneath the Ontario below the surface? [661—616]

A. I do not know.

Q. You are not able to state that.

A. No; I could measure it up on the map.

Q. You might, if you will, if you can give it to us readily. A. About 575 feet.

Q. Now, directing your attention to the workings in the westerly portion—

A. No, it is less than that. I will correct myself. I was giving it clear down to the Frank drift. Instead of 575 feet to the top of those stopes underneath the Ontario it would be—instead of 575 feet it would be 800 feet. I was using the wrong figure.

Q. What, if any, opening is there from the surface with the workings beneath the Ontario on these ore bodies referred to as the Frank and Gray and May ore bodies except through what is shown upon the map as the Silver King tunnel?

A. There is none other that I know of.

(Testimony of Fred T. Greene.)

Q. Now, directing your attention to the workings in the westerly portion of the Senator Stewart Fraction and Senator Stewart claim, I will ask you whether or not [662—617] there is any vein disclosed in those workings.

A. In the upper Stewart tunnel there is a vein exposure which has been drifted upon for a distance of nearly 300 feet and upon which there has been some slight stoping. This drift I will say instead of being on a vein is on a fault, a very steep fault. Northwest of that fault is a flat vein and the ore that was taken out from that tunnel was taken out near the intersection of that vein and that fault. The ore was also stoped below the upper Stewart tunnel for a few feet. There are five or six setts, I believe, in there that are stoped down to or nearly to the 145 foot level. That ore was taken out at the intersection and slightly below the intersection of the rather narrow flat dipping vein and a very steep fault, both having practically the same strike.

Q. Is there any other vein disclosed in those workings? A. None other.

Q. What, if any, relation is shown by any development or workings between any ore bodies or vein or veins in these westerly workings that I have called attention [663—618] to and the main Stewart vein to which your testimony has been principally directed?

A. I find nothing whereby I was enabled to connect up the two or identify them as being one and the same.

(Testimony of Fred T. Greene.)

Q. I notice on your apex map that the apex as you have placed it curves, forms what you have referred to, I believe, as an arc. Do you find any similarity to that curvature in the workings or stoping below? If so, point it out.

A. There is a similar curve, although not so great for the reason that the curves shown below are the intersections of the vein with the horizontal plane, whereas, the curve shown on the apex map is an intersection with practically three planes, with the surface, the Clancy fault and the Osborne fault which were not horizontal but steeply inclined planes. That same change of direction is shown on both the stope map and the plan map. That change is gradual, begins a long way to the southwest and in most cases follows pretty much the same arc.

Q. Give us, if you will, please, just a general description of the Osborne fault as you have observed it, stating its strike and dip and its general features.
[664—619]

A. The general strike in the Wardner district is about north 80 west. Its dip varies from around 48 degrees to the vertical. The Osborne fault is a long, persistent feature which had a marked effect on the topography and terminates practically every physical feature underground that I have followed up to its plane. I have seen it in Mullan or near Mullan, through the Mayflower mine, the Alice mine, the Sisters. I have verified the description given by Mr. Ransome in his report on this district as to its effect

(Testimony of Fred T. Greene.)

on the topography and I know it to be a long persistent earth movement.

Q. I wish you would state generally, Mr. Green, if you will, please, what there is about this vein shown in these westerly workings that convinces you that it is not the same vein as the main Stewart vein.

Mr. GRAY.—I object. He has not said so. He said that there has not been any connection made by which he can say that it is.

The COURT.—I think that is correct. I will sustain the objection.

Mr. GUNN.—That is all. [665—620]

Cross-examination.

(By Mr. GRAY.)

Q. Mr. Greene, what is the course of a vein?

A. The course of a vein is the direction it has in relation to some other thing.

Q. It is its horizontal direction, isn't it?

A. It might be and it might not.

Q. What is the strike of a vein?

A. The strike of a vein is the intersection of a vein with a horizontal plane.

Q. How do you determine the course of a vein, Mr. Greene? A. What do you mean?

Q. The course of a vein?

A. By getting its average strike over a long—over the greatest length possible with that vein. [666—621]

Q. Taking the course at any given point does not establish or show the course of the vein, does it?

(Testimony of Fred T. Greene.)

A. It does not show the course of the vein necessarily, no.

Q. It would not be a fair method of determining the course of a vein, would it?

A. It is the only method that you can determine the course of the vein by when you have only a very short distance on which to measure it.

Q. But if there are extensive and long openings on the vein, that would be an unfair and improper method, would it not, in your judgment?

A. For the vein as a whole, yes, but it is a very fair method for the individual parts.

Q. The course of the vein generally is the direction that is followed by the workings, is it not?

A. Not necessarily, at all.

Q. Mr. Green, you testified once before in this proceeding, didn't you? A. Yes, sir.

Q. Isn't that the exact language that you used on page 92 of your cross-examination, when you said:

“Q. And how [667—622] do you determine that, by taking the course at the given point, or do you go through all the property and through the various workings upon the vein for the purpose of ascertaining?

“A. The course of the vein generally is the direction which is followed by the workings.

“Q. Which is followed by the miners in their workings?

“A. Yes.”

Did you not so testify? A. I did at that time.

Q. And the language that I put to you was in your

(Testimony of Fred T. Greene.)

identical language, wasn't it, Mr. Green?

A. Yes, sir. The answer, I see, did not go far enough. I presume that you cut me off rather short, Mr. Gray, at that time.

Q. Didn't you have a sufficient opportunity to explain to the Court at that time, if you had any explanation to make, Mr. Green; were you denied any opportunity to explain or qualify your testimony?

A. No, no, I could have qualified it if it had seemed essential at that particular moment.

Q. You say that there are two great faults here that [668—623] are met in the workings, the Osborne fault, first, you mentioned. The Osborne fault is met on every level as you proceed along that level, is it not? A. Yes.

Q. The other fault that you say terminates the vein is encountered along in the stopes that rise above the highest working level upon the vein, isn't that true, and in the raises from them?

A. I did not mean to say that, because it is encountered by a drift from the Apex tunnel.

Q. With the single exception of the drift from the Apex tunnel, it is encountered only in the stopes and the raises from the highest workings from the level?

A. That is true, and it is true for this reason that in the ordinary course of mining the effort is to get under your ore body and raise upon it, and in approaching the Osborne fault it was approached practically from above, by reason of the fact that a shaft was sunk from the old lower Stewart tunnel level and drifts were run on it.

(Testimony of Fred T. Greene.)

Q. You are designating the Clancy fault?

A. You first asked me or spoke of the Osborne fault, and the fact that we approached the Osborne fault on the [669—624] level, and distinguished between that approach and the approach to the Clancy fault, and I am explaining now the approach to the Osborne fault being on the level for the reason that the openings were made through a shaft, and drifts were driven out to the extent of our ore body, and then the vein was developed upward to the Osborne fault. Had the Fir tunnel been the first opening into the mine, we would have encountered similar conditions in approaching the Osborne fault that we had in the Clancy fault.

Q. Was the ore on the Stewart tunnel level worked by a shaft?

A. No, not from the Stewart tunnel level.

Q. And the Stewart tunnel level—

A. —is not the only level.

Q. No, but it is one of your chief levels?

A. It is one of the main levels, yes, sir.

Q. The stopes which reach the Clancy fault and the only stopes which reach the Clancy fault rise from the Stewart tunnel level, do they not?

A. Yes, sir.

Q. Did you intend to say to the Court that you had seen the bend in this red apex which has been painted upon the [670—625] map Exhibit 3, yourself?

A. I have followed the apex around as shown on that map.

Q. (Last question read.) A. Why, yes.

(Testimony of Fred T. Greene.)

Q. At how many points, Mr. Green, is it disclosed?

A. In the Apex drift and in the old lower Stewart tunnel level, in the No. 1 level, in the No. 2 level and in the No. 3 level.

Q. This bend in the apex is disclosed in the Stewart tunnel level?

Mr. GUNN.—I don't think your last question related to that, Mr. Gray.

Mr. GRAY.—That was my understanding.

Mr. GUNN.—That was the first question that you were asking, about the general line of the apex on that map.

Q. This bend in the alleged red apex that is painted on the map is what I was asking about.

A. That bend is only disclosed or indicated in the Apex drift.

Q. At the three points which Mr. Clancy has already marked upon the map, isn't that true? [671—626]

A. Well, that bend—

Q. There has been no development upon any such bend as that, has there?

A. Yes, in the Apex drift.

Q. Come up here and show the Court where you disagree with all the other witnesses upon that point—

Mr. DINES.—I object to counsel commenting on his disagreeing with the other witnesses.

(Objection sustained.)

Q. Point out, Mr. Green, on there, the points where those two faults, or either of them, are disclosed in those workings.

(Testimony of Fred T. Greene.)

A. The Clancy fault is disclosed in the west face of the Apex drift.

Q. Where else?

A. The Clancy fault is disclosed in the west face and along the north side.

Q. For how far from the face?

A. Why, I should say it was 25 feet or so.

Q. Where else is it disclosed?

A. The Clancy fault?

Q. Yes. [672—627]

A. It is shown in the crosscut.

Q. Where?

A. Just about half way between station 2525 and 2117, although I will say that it is getting very close to the surface there, and instead of being one persistent gouge, it is very much broken, and the gouge, I believe, has been leached out of it, but I believe that seam exists there.

Q. Where else is it shown in there?

A. That is all I know of.

Q. Where is the Osborne fault shown in there?

A. The Osborne fault is shown on the north side of the Apex drift.

Q. Throughout its length?

A. No, sir, about 12 or 14 feet east of station 2566.

Q. At the point W, Mr. Green?

A. The Osborne fault shown further west than that, but the vein, where the vein terminates is about the point W 1.

Q. Any place else?

A. The Osborne fault shows again over at this cor-

(Testimony of Fred T. Greene.)

ner, at this jog in here. [673—628]

Q. And that is all?

A. Yes, as far as the Osborne fault shows.

Q. Mr. Green, just take a protractor, if you please, and I will take a straight edge. I want you to give me the course of this red apex as it is stated upon the map, Exhibit 3. I will put the straight edge along the wall there. A. South 46 east.

Q. It shows on there to be south 46 east from where? I want the course from the highest point, where it is developed, to the point where it crosses the east end line of the Stewart Fraction.

A. I think you are laying it at that point. Well, south 45 east.

Q. Will you get this map and point to me the point where it crosses the east end line of the Senator Stewart Fraction?

A. I would not like to select a very definite point there.

Q. Select it just as definitely as you can.

A. I haven't made any measurements there myself.

Q. Select it as definitely as you can. You have given [674—629] the course of it. Refer to Exhibit 1. I want it where it crosses the east end line as nearly as you can give it from the point where it is developed at its highest point. Mr. Green, what point are you taking?

A. From the point on the No. 2 level where I know that the vein comes up to the Osborne fault, where I have measured it.

(Testimony of Fred T. Greene.)

Q. You have answered a question and have given the course of that vein, the so-called apex of the vein from its highest point on its so-called easterly and westerly course or southwesterly and northeasterly course to the point where it crosses the east end line of the Senator Stewart Fraction claim. I want you to lay that straight edge between those points. Are you taking the point W in the east end of the Apex drift?

A. Yes, and the point on the No. 2 level.

Q. Is your red apex of the vein developed at its highest point at that point W? A. Yes, sir.

Mr. DINES.—I suggest that counsel should indicate what points he desires him to lay the straight edge between, if there is any difference between them. I don't know whether he and the [675—630] witness understand each other.

Mr. GRAY.—I am conducting this cross-examination.

Mr. DINES.—If counsel desires him to lay a straight edge between two points, he should designate the points.

The COURT.—I will overrule the objection. If Mr. Green is in any difficulty about the question, he can say so.

A. The straight edge is now at the point in No. 2 drift east, where I know the apex to be, and the point in the Apex drift where the vein is cut off by the Osborne fault, and it is the highest point so far developed where the vein is so cut off by the Osborne fault.

(Testimony of Fred T. Greene.)

Q. Give me the course.

A. The course is north 45 west.

Q. And that is where you get your course, is it, Mr. Green? A. No, sir.

Redirect Examination.

(By Mr. GUNN.)

Q. You answered the last question "no, sir." Now, [676—631] you may explain why those are not the points from which you got your course.

A. No, those two points are not the only points. The points in the Fir tunnel, in the 415 drift east, I think it is, on the 300 foot raise 314, in raise 218 east and in the east drift and in No. 5 east drift, on the old lower Stewart tunnel level.

Witness excused.

Whereupon further hearing was adjourned until January 11th, 1913, at 10 A. M. [677—632]

Saturday, January 11th, 1913, 10 o'clock A. M.

Mr. GUNN.—May it please the Court, I find that the record is not very clear with reference to the exceptions to the patent pleaded in the answer in this case, and I believe that counsel for the defendant will stipulate that the exceptions applies to this part of the Quaker claim shown upon Plaintiff's Exhibit 1 as in conflict with the Senator Stewart Fraction.

Mr. FOLSOM.—Yes.

Mr. GUNN.—And for the purpose of this branch of the case we desire to make a showing as to the quantity of ore that has been extracted and its value, and counsel for the defendant will admit, for the pur-

poses of this branch of the case, that the ore extracted by the Ontario Mining Company from the May, the Gray and the Frank ore bodies, exceeds forty thousand tons, and is of a gross value of several hundred thousand dollars.

Mr. FOLSOM.—Yes, that is without any deductions for freight and for treatment and operating expenses or anything else.

The COURT.—Of several hundred thousand dollars. No definite amount? [678—633]

Mr. GUNN.—No, sir, several hundred thousand dollars.

The COURT.—Well, in the event I find for the plaintiff, I have intimated that I should refer the question of the accounting.

Mr. GUNN.—They only made that admission for the purposes of this branch of the case. Of course, for the purposes of the accounting we shall then enter into that and show definitely the quantity and the value and the basis for the accounting.

The COURT.—Yes; that is all reserved.

Mr. GUNN.—With the understanding, then that the accounting feature of the case is reserved, the plaintiff closes and rests at this time.

Plaintiff rests. [679—634]

Mr. FOLSOM.—Your Honor, I presume understands enough about our theory of the case so that it is not necessary to make a statement. We threshed it out so thoroughly before that perhaps that is not necessary. Of course, since the time of the other hearing the answer was filed, but it follows the lines

of our affidavit in the other hearing very largely.

The COURT.—Yes.

Mr. FOLSOM.—The defendant wishes to offer in evidence and in lieu of evidence, the admission that the Ontario mining claim was located on November 1st, 1885, and was patented in 1892; that the Stewart Fraction was located on November 20th, 1899 and was patented in 1903.

Mr. GUNN.—We admit the dates as stated, but we object to this testimony as immaterial and irrelevant to any issue in the case.

(Objection overruled. Plaintiff excepts.) [680—635]

Defendants' Evidence.

[Testimony of Andrew C. Lawson, for Defendants.]

ANDREW C. LAWSON, after being duly sworn as a witness for defendant, testified as follows:

Direct Examination.

(By Mr. FOLSOM.)

Q. Mr. Lawson, please state your full name, your residence and your occupation.

A. Andrew C. Lawson, I reside in Berkeley, California, and I am professor of geology in the State University of California.

Q. How long have you held that position?

A. I have been professor of geology since the year 1890, about 22 years or a little more.

Q. From what schools did you graduate?

A. I graduated as a Bachelor of Arts from the University of Toronto, and as Doctor of Philosophy from the Johns-Hopkins University.

Q. Have you ever had any practical experience as

(Testimony of Andrew C. Lawson.)

a geologist other than teaching?

A. Yes, I have been concerned with active working geology for the last 30 years in addition to my work as a [681—636] of geology in the University. I was connected with the Canadian Geological Survey for eight or nine years, and was every year engaged in field work and in the preparation of reports for the Canadian Government, and since going to California in 1890 I have been every year more or less—except one year when I was in Europe—engaged in the study of geology actively in the field, and more particularly in connection with economic problems, the occurrence of ores, and studies of mines, and so on.

Q. Have you during that time had occasion to examine a great many mines?

A. I have examined and reported upon a great many mines in the western States and in British Columbia and in Central America.

Q. What contributions have you made to the literature on the subject?

A. I have written numerous reports and papers in the scientific literature, and besides those reports and papers contributing to the science of geology and particularly in several cases to economic geology, I might say that one of the most interesting experiences I had, and perhaps one of the most interesting contributions made was in connection [682—637] with the earthquake of 1906 in California. In that year a great fault opened in California, and the earthquake which it occasioned gave rise to a great

(Testimony of Andrew C. Lawson.)

public consternation, and after the earthquake the Governor of the State appointed me a member of a commission to investigate that matter, and in that matter I prepared, in conjunction with the other members of the commission, a *report that* event.

Q. That was published, was it?

A. That was published by the Carnegie Institute of Washington, D. C., they supplying the funds for the work and the publication of the results.

Q. Have you ever examined the Ontario mine and the ore bodies situated therein, the mine involved in this controversy? A. I have.

Q. How much time have you spent in the study of the Ontario mines and the adjacent mines?

A. I have spent some time examining the property, the Ontario and the adjacent properties some three or four years ago, the examination was incidental to other work and I did not go into details then; but in the last two or three weeks I have been studying those properties practically daily, since about the 21st of December. [683—638]

Q. You never had occasion to examine the ore bodies and veins in the Senator Stewart and the Senator Stewart Fraction claims owned by the Stewart Mining Company?

A. Yes, I have visited nearly all portions of the mine which are now open, and gone through the various levels and raises and in many of the stopes which are now open, and have taken pains to acquaint myself as far as possible with the mines.

Q. Will you describe generally the ore bodies in

(Testimony of Andrew C. Lawson.)

the Ontario, the ore bodies in the Stewart Fraction, their relation to each other, and such incidental matters as may assist the Court in determining the controversy here involved. Would you like the large map now?

A. Yes. I can use the 50 scale map, perhaps.

The ore bodies in the Ontario claim are developed best in the Gray and in the Frank stopes, and in those levels and above them in the stopes one can see that the back of the ore is a vein that has a variable thickness and a dip upward, as indicated by the stoping on this exhibit.

Mr. FOLSOM.—I desire at this time to have the exhibit marked Exhibit “B.” I will state to the Court that we desire to finish with this witness in time for him to take the afternoon train, consequently I will postpone the proof of [684—639] the correctness of the map until a later time, but I presume he may refer to it.

The COURT.—Very well. The map may be marked for identification and the witness may refer to it.

Map marked Defendant’s Exhibit “B,” for Identification.

WITNESS.—The strike of the vein in the Gray ore body and in the Frank ore body is quite regular and persistent for the extent to which the workings are opened up on the vein.

Q. For a total distance of about how much?

A. For a total distance of a few hundred feet. I should say that in the case of the Gray ore body, in the

(Testimony of Andrew C. Lawson.)

Gray drift, the strike of the vein was regular and persistent for a distance of 320 feet, and is in the neighborhood of north 30 east. In the Frank stope on the lower part of that stope in the drift the strike is persistent for a distance of over 200 feet, and has a course of about north 40 east, there being a divergence of about 10 degrees between the strike of the two ore bodies, the two being somewhat separated by a fault which passes through the level above which the stopes are driven. Now, above the ore body of [685—640] the Gray and the Frank, and including in the Gray the May ore body as a minor adjunct to it, the vein extends upward on its dip, and there are various levels run upon the vein having a general course which is indicated by the general course of the drift across the face of this map, Exhibit "B." The vein may be followed on its dip up the various stopes from one level to another, and as far as the old lower Stewart tunnel level, and to a certain extent above that level, but above that level the exposures are at the present time obscure and only a few points can be determined.

Following the level along the general strike of the vein in a northeasterly direction, the vein terminates against a fault, and it has not been discovered as far as I am aware—I at least have not seen it beyond that fault, but the fault is the one which has been referred to in this case frequently as the Osborne fault. The Osborne fault is a fault of very considerable magnitude, and of great extent, which has been mapped by the geological survey in its publica-

(Testimony of Andrew C. Lawson.)

tions in this district, but I do not vouch for the correlation of this fault with the fault as determined by the geological survey as the Osborne fault; I think there may be some doubt about that, but there is no doubt [686—641] about the fact that there is a great fault here, against which the vein in its general strike abuts and stops, constituting an end to the vein in that direction. Now, the abutment of the vein upon the fault that I have referred occasioned a local disturbance in the trend of the vein, and that deformation—that local deformation or disturbance in the vicinity of the fault is one which may be expected to occur in such a situation. It is, however, a feature of the vein which is abnormal; it is not the regular or normal condition of the vein, particularly as regards its strike. We have a normal condition manifested in the general trend of the drift along the strike of the vein, and when we come in the vicinity of that fault we encounter an abnormality, that is to say the strike is deflected from its normal course so that in taking into account the strike of the vein, we cannot select the small relatively insignificant portion of the vein which is just deformed by its abutment on the fault, and not take into account the larger amount that extends far beyond that deformation to the southwest.

Now, in connection with that consideration, I would like to point out—is there a blackboard handy?

Q. Yes.

A. I would like to say a word or two about the deformation of the vein in general, and point out that

(Testimony of Andrew C. Lawson.)

they [687—642] are exceptional and abnormal conditions of veins due to various causes, which do not detract from their general or normal characters seriously.

Mr. DINES.—We suggest that if there are to be some additional diagrams drawn we would like them preserved in such a condition that they can be put in the record. I don't think evidence should be introduced in the form of blackboard pictures so that we cannot make a record of it. If it can be done on a piece of paper—

The COURT.—Yes, I shall make that ruling.

Mr. FOLSOM.—Couldn't it be copied afterwards?

Mr. GUNN.—We could put a paper right over the blackboard.

The COURT.—It can be preserved by tracing. Diagrams may be made on the blackboard, and by tracing a record shall be preserved.

WITNESS.—(Drawing.) If we have a steep hillside, indicated by the marks "X" and "Y" on this diagram, and on that hillside there is exposed a vein, that vein may be found to outcrop in this fashion, and it may appear at the outcrop that that is the dip of the vein. At point "C" we have the outcrop of the vein, and as it appears at the outcrop [688—643] it would seem that the dip has the angle indicated in the diagram, but if it be followed further it may be found that the dip is totally different, and that this vein has a dip downward like I have indicated by the continuation of the lines from the letter "D" to the letter "E." Now that condition is by no

(Testimony of Andrew C. Lawson.)

means uncommon; it is a representation of the phenomenon which is known in geology as creep of the hillside under the action of gravity, and if these rocks be weak rocks, the extent of this zone of creeping may be very considerable, and we have a very deceptive picture as to the real dip of that vein if we did not take into consideration the fact that it was a zone of disturbance, whereby the whole surface of loose material of the hill, in picking up the vein may have dragged or bent it down the slope. Now, no geologist understanding the situation or *have* access to the information would regard this as indicative of the true dip of that vein; he would take the direction, I will say, from "F" to "E" as representing more *correcting* the true dip of the vein, and here is an abnormal condition in that vein, due to deformation under the action of gravity, and that condition of abnormal dip is not taken by anybody as suggestive, or indicative of [689—644] the true attitude of the vein in the mountain, and that condition is very analogous to the condition which prevails when we have the vein coming up against the fault. Similarly,—in a similar way the vein is deformed locally on account of the frictional resistance to movement along the plane of the fault, and the vein may be turned up slightly or bent away from its normal strike and from its normal dip, and by analogy with the simpler case that I have described the zone of abnormal condition is not to be taken as making the true strike or the true dip of the vein. In other words, in order to ascertain what the dip and strike

(Testimony of Andrew C. Lawson.)

of the vein is, we have got to follow that vein to a point somewhat beyond the point of the surface.

[690—645]

And applying that to the case in question I should say that the strike of this vein is far more clearly revealed by the levels following the vein to the southwestward than it is by the abnormal bending of the vein in the immediate vicinity of the fault or extending out possibly to 100 feet from it.

Now, there is another consideration in this particular case that I have cited here whereby we have the deformation of a vein which not only happens, that vein may bend, but if the disturbance be rather more intense, if the hillside be somewhat steeper, or if the rocks are somewhat bigger, then it is entirely possible and indeed it occurs not infrequently that portions of the vein *as* broken off and broken down and become detached from the firm vein in place, and when we have a condition of that kind we could apply the term "drag" to it; the vein is dragged by gravity, this portion or fragment of the vein is dragged by gravity away from the apex of the vein, and similarly when we have a vein coming up against a fault, particularly a fault with a large movement, we have very commonly fragments of the vein detached from their normal position and dragged out as isolated fragments into the general [691—646] disturbed condition of rock which we refer to frequently as the fault breccia or the fault gouge, so in considering what is the vein we must take into account the fact that these portions are not properly in place, that

(Testimony of Andrew C. Lawson.)

they are detached from the firm vein. So that I should be distinctly inclined to apply these principles that are commonplace in geology to the case before us, and to say that we must not describe the strike and dip of that vein by local observations within the zone of deformation, and to say further that where we are dealing with the drag pieces of vein away from the vein material, that that is something apart from the vein and detached from it, and is pertaining to the fault zone or fault breccia rather than to the vein itself. I do not know whether I have answered your question fully, Mr. Folsom, but perhaps—

Q. (Interrupting.) I will ask you if the edge of the vein against the Osborne fault which you have represented as the end of the vein, whether that at all places reaches the major fault or the big fault which they refer to in their testimony as the Osborne fault.

A. That question can be answered also by means of a diagram. [692—647]

Q. Mark the other diagram Exhibit “C.”

The said diagram was thereupon marked Defendants’ Exhibit “C,” for identification.

A. The large fault that has been called the Osborne fault hitherto in this case is well revealed on the Fir tunnel level in the vicinity of station L5103, and again on the same level at the end of the crosscut near the station marked on the map 5398, although it is not clear whether the station applies to that level or to the one immediately above it. The place I refer to is at the end of the curved crosscut on the Fir level.

(Testimony of Andrew C. Lawson.)

That same fault is also intersected on what is known as the 400 lateral, so that on that level we have three points well defined on the same level on that fault, and it indicates very materially the course or strike of the fault. The only other place where I am confident that that fault appears again—I will not say that—there is one other place where I am confident, and that is on the No. 2 level in the crosscut that is named on this map Exhibit “B,” 200 north crosscut. At the end of that 200 north crosscut there is encountered the same fault precisely as occurs [693—648] down on the Fir level, and the strike of the fault being known from this level and the strike also being nearly coincident through there on the No. 2 level at the end of this No. 2 crosscut, for a considerable distance having the same character precisely as we have on the Fir level, I have great confidence in the strike and dip of the great fault. When we come to other places where this great fault stope going northeasterly on its strike against this fault we have not the same evidence that we are dealing with the so-called Osborne fault. We have a termination of the vein undoubtedly against the fault, but it seems to me that the condition that prevails is something like this as I shall attempt to indicate on the diagram. We have the great fault coming down at an angle of about forty degrees and on the Fir level we have that fault terminating the vein on its strike, but at higher levels in the hanging-wall of that fault there appear to be branches going out probably in some such course as this, and these branches, this branch or branches,

(Testimony of Andrew C. Lawson.)

I will put it singular or plural, because I am not quite certain about it, these branches of the main fault are the things we strike on the onward course of the vein in its [694—649] strike to the northeast, and the major fault or the main fault goes on beyond underneath these. Now, as a consequence of that it seems very probable that in the blocks of country in between these subordinate or auxiliary faults which go off from the hanging-wall of the major fault and the main fault we have or may reasonably expect to find other fragments of the Stewart vein that have not been displaced so far as the fragments that are below the major fault, and that country has never been explored, but if it were explored my anticipation would be that we should encounter the same fragments, pieces broken off, between the auxiliary fault and the main fault of the Stewart vein.

Q. Now, Professor, directing your attention to the Stewart vein again, what do you have to say with reference to the course of the vein, the general course of the Stewart vein, and the general dip, the downward course, the general onward course, and general downward course, that is, what is the approximate onward course and what is the approximate downward course?

A. Referring to that question I would like to say a word or two about the general conditions, as to these questions which apply in this district. The Stewart [695—650] vein is not a vein by itself or alone; it is part of the system. We have several other veins constituting this system, namely, we have the Jersey

(Testimony of Andrew C. Lawson.)

vein, we have the Francis vein, we have the Barr vein, we have the Caledonia vein, we have the Sierra Nevada vein, and we have the Stewart vein. These constitute a system of veins running through this country and the general strike of these veins—now, I am using the word “general” very deliberately, and I am perfectly aware that in their strike we find irregularities, but the general strike of that system is northeasterly, and the general dip of that system is southeasterly, and that general fact applies to this particular case; what is true of the general direction, what is true of the group of veins as a whole in their general extent is true in this particular case, that the strike, for example, of the vein in the Ontario workings in the Gray stopes is about north thirty east, in the Frank stopes it is about north 40 east, and in the course of the upper workings in the Senator Stewart Fraction and in the Senator Stewart claims we have the same northeasterly trend of the ore strike of the vein. I would have to, I think, put the protractor on that to give you the accurate [696—651] strike of the upper parts of the vein. In a general way it is in the neighborhood of north 30 east, and the general dip is southeasterly at an angle usually between thirty and forty, but variable because of two things, namely, that the real dip is not a constant, steady value, angular value, and due also to the fact that the vein is broken more or less by faults so that its course downward on its dip is not a constant value.

Q. That direction you just gave of north 30 east was along what level?

(Testimony of Andrew C. Lawson.)

A. That was along the Stewart tunnel level. I beg your pardon, that was along the—

Q. That is right.

A. The Stewart tunnel level, yes, sir; there are two branches to that. This is the branch along which the vein runs; there is another branch that runs out to the north there.

Q. What terminates the Stewart vein on the south?

A. The Stewart vein on the south terminates very probably against what is known as the Cate fault. The Cate fault is a fault that is sometimes known as the Ontario fault. [697—652]

Q. It is the same fault that they have referred to?

A. It is the same fault as the Ontario fault, and that fault is well displayed in the upper Stewart tunnel at the point station L.5448 on Exhibit "B." That fault has a general strike of northwest and southeast, and it dips to the southwest at an angle of about forty degrees. That appears to be a persistent fault running through the country in the same sense that this great fault on the northeasterly end of the vein is and is the southerly or southwesterly termination of the vein. The vein abuts upon it and stops where it encounters that fault, and the Stewart vein is a fragment of a very much longer vein that extended far at one time to the northwest and far to the northeast, probably, and in between these two faults, this fault running through here and this so-called Osborne fault, and its auxiliary branches running through this portion of the ground from what is known as the Siligo tunnel on this Exhibit "B"

(Testimony of Andrew C. Lawson.)

down to the Fir tunnel in the vicinity of station L5103.

Q. I will ask you where the top or apex of the ores within the Ontario claim is found?

A. The top or apex of the vein upon which you find [698—653] the Frank stope and the Gray stope and the May stope, the apex of those ore bodies and of that vein is up the dip off to the northwesterly in some region not known to me, off in this direction (indicating).

Q. Have you any cross-sections that you have made on this vein showing the dip of the vein?

A. I have prepared, I think, two or three sections which are intended to indicate and illustrate the dip of the vein.

Mr. FOLSOM.—Just mark that, please.

The said cross-section was thereupon marked Defendant's Exhibit "D," for Identification.

Q. Under whose direction was Exhibit "D" prepared?

A. That was prepared under my direction.

Q. Is it correct in showing what it purports to show?

A. Yes, sir, it is correct in showing what it purports to show.

Q. Through what line was that drawn?

A. This section was drawn through the line 2-2 prime on Exhibit "B." It is the usual transverse section representing the appearance of the structural features on a plane of which this vertical plane 2-2 prime is a trace. [699—654] The section is exist-

(Testimony of Andrew C. Lawson.)

ing as showing the vein abutting on its upward course upon the Clancy fault and as showing an interruption in the downward course of the vein at a place by what is marked on this map as the Deering fault. That fault is found crossing the old lower Stewart tunnel level at a place westerly from station 5261 and on the parallel crosscut marked on the map as east three crosscut between stations 5264 and 5528. That particular fault is also found on the old lower Stewart tunnel level in the vicinity of station L5256, and it is found on the intermediate level below that station in the vicinity of between station L5081 and the top of the raise going down to the No. 1 level. Also found further out, but that is getting beyond the range of this section. I simply mentioned where the fault occurs as the warrant for marking it upon this cross-section as an interruption of the vein on its downward course from the Clancy fault.

Q. What is the other fault shown near the bottom of the cross-section?

A. The other fault is a fault that is nameless, and which is observed in this crosscut extending out from this portion of the Fir tunnel level near stations—it is [700—655] marked crosscut east 409, and the fault is near the extremity of that crosscut, and it also appears in the neighboring opening and about the station L5474.

Q. Have you any other cross-sections?

A. I have two others.

Another cross-section was thereupon marked Defendants' Exhibit "E" for Identification.

(Testimony of Andrew C. Lawson.)

Q. Referring to Exhibit "E," through what lines is that drawn upon the map Exhibit "B"?

A. Exhibit "E" represents the structural features on a vertical plane of which the line 3-3 prime upon Exhibit "B" is the trace.

Q. Just lay your ruler on there so the Court can see it.

A. The line 3-3 prime lies in the position indicated by the ruler on the face of the map Exhibit "B."

Q. What is the upward fault, farthest upward, shown on that cross-section?

A. The topmost fault marked on this section as the "lower Cate fault" is the one that is sometimes known as the Ontario fault and which crosses the upper Stewart [701—656] tunnel in the vicinity of station 5448. That particular fault is approximately parallel in its course, that is to say, it makes a very small angle with the line of section, so that in consequence of that fact the fault appears to be rather flat on the line of section, but its true dip is in the neighborhood of forty degrees.

Q. What is the next fault shown?

A. The next fault shown is the Clancy fault. That fault is the one which is projected perhaps two or three feet from the top of a raise which reveals the fault, so that while the line of section does not actually go through the top of that raise it comes within two or three feet of it only, so that there is no doubt whatsoever as to the fault being where it is indicated on this diagram.

Q. What is the next lower fault?

(Testimony of Andrew C. Lawson.)

A. The next fault on the diagram is the one which has heretofore been referred to as No. 11 fault, and is interesting as affording another interruption in the downward continuity of the vein. The fault severs the vein and it appears to be rather a flat fault, flatter than it really is, owing to the relation of the strike of that fault to the plane of the section.
[702—657]

Q. Was that cross-section also prepared under your direction? A. It was.

Q. You know it correctly represents what it purports to represent?

A. I know it correctly represents what it purports to represent.

Q. Have you still another one?

A. I have one other section.

The said section was thereupon marked Defendants' Exhibit No. "F" for Identification.

Q. Referring now to Exhibit "F," what does that show?

A. Exhibit "F" shows a cross-section of the vein in a vertical plane of which the line 4-4 prime on Exhibit "B" is the trace as shown by the ruler on the face of the map as I now hold it.

Q. What is the fault shown on that map in blue?

A. At the top, the uppermost fault is the Clancy fault showing the vein in its upward course abutting upon it. The next fault downward is the No. 11 fault interrupting the continuity of the vein, and the next fault is a small fault of minor importance on the Gray and May drifts [703—658] inter-

(Testimony of Andrew C. Lawson.)

rupting very slightly the ore bodies of the May and the Gray.

Q. I will ask you, Professor, if any portions of the top or apex of the Stewart vein below the Clancy fault is found abutting on the Osborne fault, found against the Osborne fault—if the top or apex of the Stewart vein is found against the Osborne fault below the Clancy fault? A. It is not.

Q. What have you to say with reference to the nature of this vein, as to whether or not it is a fissure or replacement vein?

A. It is both. It cannot be segregated from the fissure veins. It is, to be sure, a vein in which the ore has been deposited very largely by processes of replacement, but those replacement processes have gone on along a fissure, and it is both a fissure vein and a replacement vein. The deposition being by processes of replacement and the fissure determining the locus or place of deposition and the extent of replacement being variable out from the fissure on either side.

The COURT.—Do you want to introduce these cross-sections? [704—659]

Mr. FOLSOM.—Yes, sir, in just a moment.

Q. On all of the cross-sections, the vein is represented by red and the faults by blue lines?

A. On all the sections the vein is represented by red and the faults by blue, and I would like to state further, as I think I failed to do so, the fact that the sections are drawn at right angles to what may be fairly taken as the general strike of the vein.

(Testimony of Andrew C. Lawson.)

Mr. FOLSOM.—I offer them all in evidence, all the exhibits that have been marked, excepting Exhibit “B.”

The COURT.—They will all be admitted except “B.”

The said exhibits were thereupon all marked admitted except the Defendants’ Exhibit “B.”

Mr. FOLSOM.—You may inquire.

Cross-examination.

(By Mr. DINES.)

Q. Professor Lawson, Plaintiff’s Exhibit “C” identified by you and sketched on paper was intended simply as an illustration and not as representing anything that appears in the ground in the mining workings in controversy? [705—660]

A. That is true.

Q. In that case, you have shown X–Y which is supposed to represent the surface of a mountain?

A. Yes, sir.

Q. And at point “C” you have assumed an outcrop of a vein? A. Yes, sir.

Q. Outcropping on that surface. And from your point “C” to “D” you have simply represented an ordinary condition of a vein, as you say, as it creeps in the course of time to a point a little farther down than it was supposed to be in relation to the other portions of the vein at first; is that right?

A. That is so.

Q. Is not that caused more—the characteristic bending that you have shown in Exhibit “C” is not that caused more by the general wash down the

(Testimony of Andrew C. Lawson.)

mountainside, the washing off of the material, the washing off of portions of the vein, until you have a vein left, rather than by the weight of the mountain?

A. No; that is not so. The wash, the term "wash" is used in geological practice to designate the material [706—661] that is carried down by the rush of waters from steep mountain slopes to the lower flanks of the mountain, and this particular phenomenon that is illustrated in Exhibit "C" is a different thing; it is the gravitative pull or deformation of the rocks beneath the wash.

Q. Your idea is, then, that the weight of these rocks beneath here have simply pulled the vein down along the lines of action or gravity; is that right?

A. No, sir, it is not. When I speak of the gravitative pull I mean the pull of gravity on the whole mass acting down here; I do not mean the pull of gravity on this part, hitching onto this and pulling that down there. But I mean the general pull of gravity to this slope tends to cause the material to be bent over so that any straight lines that are going up there would be bent over, any lines that appear on that surface would be bent over in response to that gravitative pull.

Q. Do you assume then in connection with this exhibit something that you have not yet stated, that the weight that was over the portion of the vein marked "CD" which you have represented as being bent down was more than the weight that was put upon other portions of the vein? [707—662]

(Testimony of Andrew C. Lawson.)

A. No, I had no indication of that kind in my mind. The illustration as I see it is a very simple thing, and I have no reservations of that kind. Simply with that surface exposed by erosion and the action of gravity tends to deform the superficial zone of the mountain somewhat faster than erosion can remove the materials, so that we see the effect of the bending under gravity.

Q. Do not the—does not the action of erosion in your freezing of winter, your thawing and the weathers going down, the general tendency to go down hills of the surface rocks and other materials, going along through this period of years, tend to finally wear that vein off until it is in a different place from what it was when it was originally deposited in the earth?

A. The processes of erosion certainly do tend to remove the loose materials on the surface and to also supply other new materials, and there is an erosive process going on; in fact, this assumed regular surface, the mountain surface here and mountain slope is the projection of the erosion as the surface of all the mountains around about us here are, and yet that erosion is not the cause of this bending; the erosion acted down to that [708—663] line and the mass of the mountain below that line is being deformed under the action of gravity.

Q. Your Exhibit "C" presents the vein that you have assumed in the cross-section? A. Yes, sir.

Q. That is, you put a vertical plane through?

A. Yes, sir, it is intended so.

(Testimony of Andrew C. Lawson.)

The COURT.—Objection is overruled.

A. I think that question is hardly intelligible. I would like to have it restated.

Q. Well, I will try to make it clearer. In considering the question of the dip of the vein in reference to certain definite boundaries, such, for instance, as we have in mining locations, where you have surface boundaries of definite extent, a limit on the surface of the ground, this portion of the vein with the dip CD is in one surface boundary and the portion here, as it changes its dip, from F to E is within the location of another surface boundary, now, when you are considering the relative rights of those two from a standpoint to that vein and confining it to the geological standpoint, you would not say as to the proprietor of the surface that has the dip C to D, that the dip of his vein was from F to E, would you?

Mr. FOLSOM.—I object to that on the same ground. I do not understand that the Professor is determining the relative rights of the parties.

Mr. DINES.—I ask for the geological situation alone.

(Objection overruled. Defendant excepts.) [712—667]

A. An answer to that question is hardly possible, because this portion from F to E is under the same surface exactly as that from C to D, so they cannot be under anything but the same surface, as I understand the situation.

Q. You don't claim that the vein on Defendants' Exhibit "E" which is shown here that you have re-

(Testimony of Andrew C. Lawson.)

ferred to as the Frank and Gray and May ore bodies, is under the same surface as this portion of the vein that you referred to up here, do you?

A. Certainly not; that is a different situation. Here is the situation—

Q. I am assuming—you can be relieved of that responsibility. I am assuming that the surface boundaries are so located as I told you, that the surface boundaries of one *and is* right—this portion of the vein is under one locator's located right, and the other C to D is under the first one that I assumed, and you can relieve yourself of the responsibility of the truth of the hypothesis.

Mr. GRAY.—I object to the question as improper cross-examination. It goes into something that is entirely different from even the diagram which the Professor drew to [713—668] illustrate something else.

The COURT.—I will overrule the objection. If the Professor can answer, he may do so.

(Defendant excepted.)

A. I find great difficulty in answering the question, owing to the fact that as near as I understand my own diagram, this portion of the vein from F to E is under the same surface exactly as the portion from C to D. Now, how can I discriminate. The question cannot be answered.

Q. Well, Professor, you don't desire to answer that question then?

A. I am perfectly willing to answer that question or any other, if I can.

(Testimony of Andrew C. Lawson.)

the dip of a vein which is involved in any litigation, you *may* a distinction between the dip of the vein, malformed, as you have stated, by the creep or the weight that tends to place it down along lines of the action of gravitation, and the vein as originally fissured in that position?

A. You asked me whether I make a distinction between the two cases?

Q. Yes.

A. Oh, yes, indeed; the distinction would be very pronounced, that if this were the original strike of the vein you would have one thing, and if that be a local variation or deformity of the vein you would have another; that is to say, that the two cases are quite distinct from one another.

Q. When you find the vein as you can see and study it in the mountain, you find it with certain irregularities of strike and dip, you mean to say that in the case of a vein where you can account for them geologically as having causes possibly operating over hundreds of thousands of years, that you would go to those remote causes in determining what was the true dip of the vein, rather than to take the thing that was before your senses, the physical [717—672] evidence in the ground; is that right?

A. Certainly. Geology goes back a long way.

Q. That is correct? A. Yes.

Q. It goes back longer than mining locations?

A. Very, very much longer.

Q. Now, I show you Exhibit "D," the cross-section; this is also a cross-section, if I understand you

(Testimony of Andrew C. Lawson.)

correctly, which is made on a vertical plane through the line 2-2 prime on that section. A. Yes.

Q. Why did you have that—you say that was done under your direction; why did you put that plane in that particular place?

A. I made the section to bring out graphically the general downward course of the vein in a direction normal to the general strike of the vein.

Q. When you had that vertical plane passed along the line of its projection, did you consider the question whether it would cut the Clancy fault?

A. It was apparent that it would.

Q. In determining that— [718—673]

A. It was apparent from an inspection of the map before I drew the section that the section would pass through the Clancy fault.

Q. Did the Clancy fault have something to do with your putting the section through that particular part; was that what caused you to identify that and select it, among other matters that you may have taken into consideration?

A. I may have taken that diagonal line because it would cut through the Clancy fault.

Q. Did the Clancy fault have anything to do with your selection?

A. It was intended by that section to show the upper termination against the Clancy fault. That was one of the things that comes out very clearly.

Q. And therefore, as it was intended that way, you selected a portion that showed the termination of that vein against the Clancy fault.

(Testimony of Andrew C. Lawson.)

A. That was one of the things.

Q. Did you also consider, in making that selection, where you could get a line through the Deering fault in the same way? A. Yes. [719—674]

Q. And did you consider also the unnamed fault in the southeastern portion of the exhibit?

A. I recognized in looking at the line on the map at right angles to the strike, that that line would cut through that fault. Yes, I recognized that.

Q. How much projecion is there of the vein between the Clancy fault and the Deering fault that is shown in red, and how much of that is actually shown in the ground there?

A. Well, the section 2-2 prime passes through the Clancy fault at a point which is determined by the general line drawn from the top of raise marked raise No. 2 west on the south side line of the Senator Stewart Fraction, and another point at the southwestern extremity of the Siligo tunnel. In between the position of the Clancy fault has not been observed by me.

Q. Do you know of more than two places that you can identify the Clancy fault, the two places that you have named?

A. I only know those two places in the Senator Stewart Fraction.

Q. How much of the Clancy fault is exposed so that you can see it in the southwestern portion of what you call the [720—675] Siligo tunnel and what we call the Apex tunnel?

A. There is quite a good exposure there.

(Testimony of Andrew C. Lawson.)

Q. Can you tell me how many feet?

A. I should say that it was exposed for about 20 feet or a little more perhaps.

Q. Did you take the course or strike of the Clancy fault from its exposure in the tunnel?

A. I believe I did, but I observed that it *had* oblique to the tunnel, so that the tunnel itself shows the course of that portion of the fault in that tunnel.

Q. The same tunnel?

A. Yes, the Siligo tunnel.

Q. You do not claim that it is shown anywhere in the tunnel, shown in this portion of it?

A. The Clancy fault is not exhibited in this tunnel as far as I am aware, probably owing to the way in which this was so thickly lagged, and so on.

Q. As you found the strike or course of the fault in the Siligo or Apex tunnel, did you make your own observations of that strike? A. I did.

Q. What was it? [721—676]

A. The course of that fault in that tunnel is about—I can hardly get backing for this ruler here on the map.

Q. May I assist you?

A. Well, I have some trouble in laying it flat. That reads about north 40 east.

Q. Did it have that course for the entire exposure of the 20 feet?

A. Yes, it seemed pretty straight.

Q. What was its dip at that point?

A. As I remember it, it was about 35 degrees.

Q. In what direction?

(Testimony of Andrew C. Lawson.)

A. To the northwest.

Q. What was its course as you found it on the raise on the southerly side line of the Senator Stewart Fraction?

A. I am unable to state what its course is at the top of that raise.

Q. Then, in determining the course of the Clancy fault on Exhibit "D" as prepared by you, you again excluded the question of what was the course of the fault in the one of its known positions, did you?

A. I did not intentionally exclude anything. I took the observation. It was not a matter of exclusion. [722—677]

Q. No, I don't say that; I am asking simply for the facts, that if, in giving the course and strike of the fault as shown on Exhibit "D," you took into consideration the course and strike of the fault is disclosed in the upraise on the southerly side line of the Senator Stewart Fraction.

A. It is not disclosed there.

Q. Didn't you so state?

A. The strike and dip is not disclosed. The fault is disclosed; you can see the fault gouged perfectly plainly, but on account of the timbers and so on, you cannot determine with any degree of satisfaction what the course is.

Q. Did you make any effort to determine it there?

A. Oh, yes; it was quite an effort to get up in that raise.

Q. If you could not determine its course and dip in the raise that you have referred to, how could you

(Testimony of Andrew C. Lawson.)

get any data by comparison to identify it with the Clancy fault in the position where you identified it in the Siligo or Apex tunnel?

A. Well, I have been fortified in that belief by the exhibit, the stope map that was introduced in evidence, and [723—678] by listening to the evidence that was presented in regard to the position of the Clancy fault, so that my belief was greatly strengthened by what I heard, that it lay across there.

Q. Can you point to the evidence or quote what the evidence is that you refer to about that from which you got your data, instead of getting the course and dip of the upraise on the south side line of the Senator Stewart Fraction?

A. Yes, I can give you further information about it. The fault is well exposed in a raise called raise No. 7 from the lower Stewart tunnel level, and in the upper portion of that raise above section 5083 from an elevation of about 3028 to 3040 the fault is well exposed.

Q. Did you take the course of it at that place?

A. I did.

Q. What was it?

A. The course of that fault is very nearly at right angles to the top of that raise, but not quite; it makes a small angle there.

Q. Will you give me the course, if you can? Didn't you have notes that you took at the time?

A. Yes, I may have some notes on it somewhere.
[724—679]

(Testimony of Andrew C. Lawson.)

Q. Give us your notes of that course.

A. The course as I observed it at the top of that raise was north and south. The dip was westerly at an angle of about 30 degrees.

Q. Well, you find quite a variation between the course of the fault as exposed in the Siligo or Apex tunnel and the course of the fault as you took it in the workings that you have last referred to, did you not? A. Yes.

Q. Now, you have made a study of faults, have you not, in connection with your geological studies?

A. Yes.

Q. And have contributed to the literature on that subject? A. Yes.

Q. Is it not true that one way you have, where a fault is exposed at one place and another place, to correlate it, is to compare the dip and course at one place with the dip and course at the other place?

A. Yes.

Q. Did the Clancy fault have a gouge as exposed in the tunnel?

A. It had a gouge, yes. [725—680]

Q. What do you mean by the gouge of a fault?

A. It is the product of attrition in consequence of the movement of one wall of the fault upon another.

Q. Did it have a gouge as disclosed for a short distance in the upraise which you refer to along the southerly side line of the Senator Stewart Fraction?

A. Yes.

Q. How did the gouge compare, one with the other?

A. I think it was rather larger, but not so well

(Testimony of Andrew C. Lawson.)

observable, owing to the timbering of the raise. The gouge was apparent, but you could not tell much about its course.

Q. Did it have a gouge in the part that was disclosed that was in the Senator Stewart claim?

A. Yes, it had a very fine gouge there, very well defined, and it could be seen for a considerable number of feet.

Q. How did that gouge compare with the other?

A. It was rather a better gouge, a well-defined gouge.

Q. What is the distance between the point where it is exposed in the Siligo tunnel and the other point where you took its course and dip in the Senator Stewart claim? [726—681]

A. You mean as scaled on the map?

Q. Yes, just enough for an approximation.

A. 720 feet.

Q. Now, there is room, is there not, from a geological standpoint for a grave doubt whether you have the same fault exposed in the two places?

A. Yes, there might be a doubt.

Q. You have an area of country here in which faults are found and frequently developed, and a great many of them, and some differences of opinion as to the identification of them? A. Yes.

Q. And you have already suggested that there is a difference of opinion between yourself and the Government geologists, Mr. Ransome and Mr. Calkins as to the identification of the Osborne fault?

A. No, sir, that is not true.

(Testimony of Andrew C. Lawson.)

Q. I thought you had some doubt as to this being the Osborne fault?

A. Yes, but that has nothing to do with the Government geologists. I do not think that the Government geologists have identified this particular fault as the Osborne fault. [727—682] They have described a very long and large fault running through this district, but there is some doubt perhaps, as to this one being the Osborne fault.

Q. Now, directing your attention to Exhibit "D," in how many portions of the plan map Exhibit "B" do you find the portion of the vein between the Clancy fault and the Deering fault exposed; I am speaking of the vein now, the red line?

A. The vein is exposed in—I am not sure that it is exposed there, but I presumed that the vein followed this Senator Stewart level, and there is a raise above it through which the section passes, and in that raise, just a short way above the level as indicated here and marked on Exhibit "D" as an intermediate, I saw the vein.

Q. You did not see the vein, then, in the tunnel, the portion of the drift marked drift 4 west, but you did see it in the raise?

A. The raise being a very short distance above the level is no doubt in my mind that the vein is in the level going down from the raise.

Q. Well, you did see the vein disclosed at that point, and for what length?

A. Where it is disclosed? [728—683]

Q. The number of feet on its dip.

(Testimony of Andrew C. Lawson.)

A. It is disclosed for the greater part of the length of this drift, except a few feet at the extreme end, which is caved, but I should say for over four-fifths of the length of the drift the vein is exposed at a number of places.

Q. How wide do you find the vein, or how thick, between walls, if you could tell it at that point?

A. Well, as I remember it it was not a very large vein; it was a vein, as I recall it, of something like two or three feet in width.

Q. It was pinched down very much from what you found it in other portions of those workings, was it not?

A. Well, the vein is sometimes large and sometimes small.

Q. On this particular place where this cross-section was driven through it was an impoverished portion of the vein, was it not?

A. Well, it may be so. I did not see any particularly large stopes there, indicative of a rich vein; it seemed to be rather small.

Q. Before we leave the Clancy fault, when you went up into the raise along the southerly side line of the Senator Stewart Fraction, raise No. 2 west, did you follow a vein as you went up the raise?
[729—684]

A. The vein is at the bottom of the raise and appears at the top of the raise, but is not continuously exposed in the raise.

Q. Did you find enough in that raise to enable you to determine whether or not the Clancy fault termin-

(Testimony of Andrew C. Lawson.)

ates the vein at that point, or that a fault of any kind terminates the vein?

A. Yes, I think so; that was my judgment there, that we had the vein in a general way followed by that raise to the top, and at the top we encountered this gouge which I interpreted as being the gouge of the Clancy fault.

Q. You are not able to identify that vein as any vein in these workings, are you?

Mr. FOLSOM.—To what?

Q. That vein in the top of the raise, I mean with the vein in the workings westerly of that point, westerly of a line drawn through the raise at right angles to the southerly side line. Have you been able to identify that vein that you found there terminating against the fault with any vein in the westerly portion of the Senator Stewart Fraction?

A. There might be some doubt about that, but I should say that I would be just as much inclined to identify that [730—685] vein up there, exposed in the upper Stewart tunnel level, with the vein below the Clancy fault on the lower Stewart tunnel level as I would be to correlate the Frank ore body with the Gray ore body.

Q. I was not asking you for a comparison. I am asking you if you are able to correlate or identify that vein that you find terminated in the upraise with any portion of the vein in the Senator Stewart Fraction lying to the west of the line that I gave you.

(Testimony of Andrew C. Lawson.)

A. And in my answer I indicated the extent I could do so.

Q. Well, you cannot do so?

A. Well, if I cannot do so, then I cannot correlate the Frank with the Gray or the May.

Mr. DINES.—I would like to have that question answered.

The COURT.—Answer the question categorically and then you can make your explanation afterwards.

A. I would correlate the vein in the upper Stewart tunnel level with the vein in the lower Stewart tunnel level, with the reservation that it could not be brought to a demonstration with the present opening of the ground, but that there is a very strong presumption in the attitude of [731—686] the vein in the upper Stewart level in relation to the vein in the lower Stewart level, that it is the same vein.

Mr. DINES.—I move to strike out that portion of the witness' answer to the effect that there is a very strong presumption.

Mr. FOLSOM.—No, he is an expert witness.

The COURT.—Let him make his explanation. I shall deny the motion.

(Plaintiff excepts.)

Q. Now, Professor Lawson, you are not willing to say to the Court positively that the vein you find disclosed at the top of the upraise, raise No. 2 west, along the southerly side line of the Senator Stewart Fraction, is the same vein that you find in the workings on the upper Stewart tunnel?

Mr. GRAY.—I object to that on the ground that it

(Testimony of Andrew C. Lawson.)

is repetition. The Professor has given his entire opinion in reference to that matter.

(Objection overruled. Defendant excepted.)

A. I would not do so positively.

Q. Do the ore bodies to which you have referred in the first part of your evidence under the surface of the Ontario, known as the Frank and the Gray and the May ore bodies, belong to the same vein that has been called here the [732—687] Stewart vein, the vein that is disclosed in the easterly portion of the Senator Stewart Fraction claim?

A. That is my opinion.

Q. Now, as you went along the upraise, raise No. 2 west, you went upward to the termination of the vein there, did you not, that you saw? A. Yes.

Q. You don't think that the vein goes any further at that point in a westerly or northwesterly direction? A. I do not.

Q. Do you know how far you were from the surface at that point, immediately adjacent to the upraise?

A. The top of that upraise is at an elevation of about 3022, and it is almost immediately below contour No. 3150; that would give us the difference of 128 feet.

Q. Did you find stopes to the northeasterly to the upraise which you have just identified above the old Stewart tunnel level?

A. I could see the evidence of stopes, but the stopes were not accessible, except this little thing in here

(Testimony of Andrew C. Lawson.)

which might be by courtesy called a stope, drift No. 4 west.

Q. You never went up in those stopes to examine whether [733—688] there was a termination, or to find a termination of the vein as it crosses the southerly side line, if it does at the point that is claimed by us, and goes in this direction as shown on Exhibit 3, of the plaintiff.

A. You asked me whether I ever went up into the stopes?

Q. Yes.

A. No; the stopes are not open at the present time; they cannot be visited.

Q. Did you go up the upraise from the Siligo or Apex tunnel that is extended up above the level of that tunnel to the surface in the workings of the Stewart?

A. I did not go up that raise above the level of the Siligo.

Q. So you cannot say what that discloses from your own observation?

A. No, I made no observation there.

Q. Did you follow along this tunnel and observe what is shown as you go easterly from the point where the crosscut tunnel enters? A. Yes.

Q. Did you go to the breast of the workings in that tunnel? [734—689]

A. The present breast. You see they have been working in that tunnel since I have been in Wallace, so I have not seen the latest face.

(Testimony of Andrew C. Lawson.)

Q. What did the face show when you were there last?

A. When I was there last they were working right in here and there was very little that I could identify as vein. I found the gouge in here, pronounced gouge in here on this side of the drift.

Q. That was on the point—

A. I should say that it was about—I will measure that, it may be of interest. It is somewhere about 20 or 25 feet a little east of south of station L 5428. There I saw a very heavy gouge, a strong gouge.

Q. Could you identify that with reference to whether or not it was the gouge of what is called the Osborne fault?

A. In my judgment it was not the main Osborne fault; it was apparently or probably one of these hanging-wall spurs from the main fault.

Q. Did it seem to terminate the footwall of the vein as it come up against it there going into the tunnel?

A. Yes, that was my opinion about it, that the vein [735—690] coming along here in the stopes above the level, was terminated on its strike against that gouge.

Q. Did you go in the crosscut to the hanging-wall of the vein that is disclosed in that tunnel?

A. I did.

Q. What did you find in that, Professor?

A. I found that the crosscut went out to a caved ground which appeared to be a cave above the old stopes below the Siligo tunnel.

(Testimony of Andrew C. Lawson.)

Q. Was the hanging-wall of the vein disclosed in the face of that crosscut?

A. I think not; not the hanging-wall, sir.

Q. Was it in vein material?

A. I am of the opinion that it is not the vein in that crosscut; I am of the opinion that the vein is represented by the stopes below this cave. Now, there may be some vein material there, but I could not find any; that is, if the vein is there it is extremely poor and very much oxidized, and certainly there is no galena there.

Q. You found iron stains there?

A. Yes, you can find them anywhere.

Q. Any evidence of carbonates? [736—691]

A. I found no carbonate.

Q. Did you make any assays or tests of it?

A. I did not.

Q. Your only judgment was from its general appearance?

A. I judged by inspection with the eye.

Q. You are able to identify the vein where it goes down on the stopes?

A. I do. I judged that that vein represented approximately where the vein is below.

Q. And the effect of that would be to bring the top of the vein at that point further within the lines of the Senator Stewart Fraction claim than has been designated on our map, wouldn't it?

A. Further from the lines; what is the meaning of that expression?

Q. Further to the south?

(Testimony of Andrew C. Lawson.)

A. Further to the south than what?

Q. You have the crosscut tunnel here? A. Yes.

Q. That is a crosscut out to the hanging?

A. Yes.

Q. Now, I understood you to say that you thought where [737—692] it caved down on the stopes that that was more indicative of the vein than the portion that you saw in the body of the crosscut. A. Yes.

Q. I say that the effect of that would be to bring the top of the vein there further to the south than was designated by our witnesses.

A. Well, there is one consideration that modifies that conclusion, namely that the caving would be down vertically, and that the vein is going up on its dip, so that the vein might, if it continued up, outcrop at a little to the north of that cave, by reason of its dip, but as I stated, I could not find the vein there positively; I could not assure myself that the vein was in that crosscut. [738—693]

Q. If it is in the vein it is very close to where it comes in contact with the surface wash?

A. Yes, sir, I think it is pretty close to there.

Q. Then you do not have any serious challenge to the proposition that so far as the proposition of the workings is concerned the top of the Stewart vein is within the boundaries of the Senator Stewart Fraction claim, do you?

A. Well, that involves a consideration of what you mean by top. If you mean edge—

Q. I will use the word "edge," if you prefer it. I am not trying to trap you in any way.

(Testimony of Andrew C. Lawson.)

A. It really involves a consideration of that top there, though—

Q. (Interrupting.) I do not wish to involve you. I will ask you if it is a terminal edge?

A. It is an edge, yes, sir.

Q. An edge? A. Yes, sir.

Q. Then we will call it a terminal edge so that you and I will not be confused in our understanding of what it is. You think it is a terminal edge? [739—694]

A. Yes, but I must explain a little further, that having expressed the opinion that the vein in the upper Stewart tunnel is very probably the same vein that we find below the Clancy fault, that it may not be the extreme terminal edge; it may be an edge against the fault, it may be an extreme or top edge, but I do not want the term “terminal” to involve that implication.

Q. We will get at the facts, Professor. You think that a portion of the Stewart vein is found within the lines of the Senator Stewart Fraction claim at this point nearest the surface?

A. I think that is so.

Q. That is correct, is it? A. Yes, sir.

Q. Well, we have found a point that we can agree on. Now, so far as the point to which you have just directed my attention, and seeming to bother you, that if there should be a correlation of the vein that is disclosed in those workings on Exhibit “B” or “D” of defendant’s and called the Stewart vein within some future development, in some point over

(Testimony of Andrew C. Lawson.)

here, where an apex is developed or a top or terminal edge or a top of the vein near the surface [740—695] is developed, that would not necessarily preclude that there would be another part that might be nearest the surface, would it—take a bend of the vein, take the vein on the course of its apex.

A. No, you could have a number of courses on a vein, in fact, at the surface.

Q. You frequently have that. Take the form of a curve—are you familiar with what is known as the Horseshoe base where it took the form of a horseshoe and was designated a vein; you have seen veins similar in occurrence? A. Yes, sir.

Q. Where the apex is in a curve? A. Yes, sir.

Q. Now, doesn't it happen when you have that particular formation the course to the apex of a vein, or to the portion of the vein nearest its surface, whatever you call it, that there will be a number of points in that line that will all overlies the same body of ore down below in the vein?

A. I am not quite sure as to what the English language means there by "overlie." It seems a common word, but [741—696] when you ask me if a number of points overlies the ore, that is questionable.

Q. Well, I will put it in this form, then, Professor, if you prefer it. Is it not true where it goes in that form that I say, and I am taking a typical vein now, not particularly confining you to this, if you descend from any point on your assumed apex, an apex in the form of a horseshoe or a curve, if you follow from any point on that apex on the true dip of the vein at

(Testimony of Andrew C. Lawson.)

right angles to its strike at any point, that you will find that those points of apex following down the line at right angles to your strike of the vein at that particular point will have several points of apex covering the same point in the vein below?

A. Surely, surely; that goes without saying.

Q. Yes, sir. So I say, then, your supposititious case that there might be an apex of this vein found in the westerly portion of the Senator Stewart or Senator Stewart Fraction does not necessarily preclude the proposition that you may have an apex in the Senator Stewart Fraction claim at some portion of it.

A. I do not think it necessarily precludes it, no, [742—697] not necessarily.

Q. Now, as you examined the points where the Senator Stewart vein or the Stewart vein comes in contact with this fault which we call the Osborne fault at the various points that have been detailed along the raise R 218 E, I believe, the raise 218 E I believe it is *is*, I mean this raise here—

A. Yes, sir; I see it, that is 218.

Q. Yes, sir; and at the points of the Fir tunnel in the Fir tunnel level and the 300, have you examined the condition of the vein where it comes up in immediate contact with the fault?

A. Yes, sir; I have examined the ground through those openings that you have referred to with that object in mind.

Q. Is it your opinion that the fault terminates the vein in its upward course at those points?

(Testimony of Andrew C. Lawson.)

A. No, it terminates it on its strike.

Q. Well, I did not ask you whether it was its strike or whether it was its dip; I asked you if it terminated it on its upward course.

Mr. GRAY.—He said no and is explaining.

The WITNESS.—I am ready to answer no. I answered [743—698] no.

Q. You answer no? A. Yes.

Q. Is it not true that those points where the Stewart vein comes in contact with the Osborne fault are in a higher horizontal plane than the ore bodies under the Ontario which you have identified?

A. Will you give me a point on those two lines?

A. I will take any one of them, any point where you have found in those workings the Osborne fault terminating the Stewart vein, are those points, any and all of them, in a higher plane of elevation, horizontal plane, than the ore bodies in the Ontario to which you have referred?

A. I will select a point which would negative your question.

Q. All right, sir, I will take that point and meet it and then go to the others.

A. We will take the point at the foot of the raise 314 E on the 300 level, and we will follow that level southwesterly into one branch, the Gray stope, and into the other branch, the Frank stope, and I cannot say—in fact, my opinion is that the level where it enters the [744—699] top of the Frank stope and the level where it enters the top of the Gray stope is somewhat higher than the point at the bottom of this

(Testimony of Andrew C. Lawson.)

raise at the point 5129.

Q. Did you take the elevations there?

A. I am basing that conclusion upon the grade of the level, that the grade of the level is going up in this direction.

Q. Have you taken into consideration the fact that you go into the top of the stope?

A. Yes, sir; that is what I say, I have taken into consideration the fact that I go into the top of the stope.

Q. And the point you have named is above the level?

A. The point that I have named—we have a stope here above the level also, yes, sir.

Q. Yes. And you have the point where the vein comes in contact with the Osborne fault above the level, haven't you?

A. I suppose that plug is in the top of the level, the surveyor's tag or station, but for practical purposes the difference may be a few feet one way or the other, but my judgment is, if you will allow me to collect my points in answer to it— [745—700]

Q. I am going to take the other points now.

A. That these points on top of the stope in the Gray and the Frank appear practically as the stopes in the northeast of the No. 2 level.

Q. And in going there you do not follow a plane parallel to the end line of the Senator Stewart Fraction, do you, the level goes down?

A. You follow the level, yes, sir.

Q. And that does not go—

(Testimony of Andrew C. Lawson.)

A. (Interrupting.) It is diverging somewhat from the end line.

Q. Take the next point as you go northwesterly where you find the termination of the vein against the Osborne fault.

A. Well, any other point, for example, up here on the No. 2 level, would of course be higher of the developed stopes on the Gray or the Frank, but I should like to explain in that connection—

Q. Make any explanation you wish. You answer the question, however, that it would be in a higher horizontal plane?

A. I answered that question definitely, and I would [746—701] like to explain by stating that if you take the plane of a vein on which that black line “AB” is the apex and follow it on its downward dip into the ground we may encounter a condition which will quite clearly constitute a bottom to the vein. It may be cut off very positively at the bottom by a fault so that if you try to penetrate the ground below that bottom termination or lower edge, that you will not find the vein anywhere. Now, it is entirely possible to go downward even from the bottom of the vein. I can take a downward course from the bottom of the vein and keep on going down and be in the vein all the time, so that considerations of that kind have to be taken into account when I answer a question of this kind as to whether these ore bodies are down from that point or not.

Mr. GRAY.—Mark that illustration, will you, Mr. Reporter, so that we will have that.

(Testimony of Andrew C. Lawson.)

Mr. DINES.—Yes, sir, mark it as the counsel wishes. I have no objection; I will be glad to have it.

Mr. GRAY.—Exhibit “G,” isn’t it?

Mr. DINES.—The Defendant’s Exhibit “G.”

Mr. GRAY.—I think so. [747—702]

Mr. DINES.—I think that is right. The last one is “F.”

Q. You have drawn on what is to be identified as Defendant’s Exhibit “G” what you call a bottom edge or termination to a vein?

A. Will I make that “XY”?

A. Yes, sir, make it “XY,” between the points “XY.” You have also drawn another line making an angle with that line; will you kindly designate that, too? A. “PQ.”

Q. “PQ.” What angles have you taken for this, and what have you compared this plane with on this exhibit?

A. I have taken no particular angle, and I have made no particular comparisons except to point out, I desire to point out that I can start on the bottom of a vein and still go down and remain in the vein, and that that consideration must be kept in mind when I am answering the question as to whether I can go down to a point in this abutment of the vein on a strike upon the fault into the Frank and Gray ore bodies.

Q. I direct your attention to a line drawn in the direction that my pointer indicates on this Exhibit “G,” [748—703] and ask you if you found that to be an edge, would you as readily identify it as a

(Testimony of Andrew C. Lawson.)

bottom edge as you did the one you drew?

A. I would not.

Q. You think that would be a top edge, do you not?

A. It might be.

Q. And as I go along here, what would that be? I would like to have you mark the line of my pointer, in the first instance, if you please; I think I had it about at right angles to it, just put a dotted line, if you please.

(Witness marked exhibit.)

Q. Will you kindly mark the point of intersection of the line "AB"? A. "MN."

Q. Now, taking your own illustration where we have the line "MN" projected here and making an angle that is disclosed on this exhibit with your line "FC," you would not, you have stated, identified "MN" as a bottom edge; it would be a top edge, would it not?

A. It might be so considered as a top edge, yes, sir.

Q. Now, where you have a fault such as the Osborne [749—704] fault with a strike approximately north 75 to 80 west and a dip varying from forty degrees in some places to the southwest and in others a dip of seventy degrees, and you have a vein with a course such as you have found in the ground, the Stewart vein, to have a dip such as the Stewart vein has, will it make a line of intersection with the Osborne fault where they came together more like the line "MN" that is shown on Exhibit "G" or more like the line "XY"?

A. I should say that it would make a line more like the line "XY" in this particular case that we

(Testimony of Andrew C. Lawson.)

are dealing with; that is to say, taking the course of that apex indicated on Plaintiff's Exhibit 3, the course of which is between forty and forty-five northwest, taking that for the course of the edge of the vein, I would say, taking that for the course of the edge of the vein the strike encountered on that edge will make such an angle with it that the edge of the vein overhangs and that if you start at any point in that apex, particularly the extreme point, and attempt to go down on the true dip of the vein you will leave it absolutely and go down into barren rock below the vein, because that intersection has a slight [750—705] overhanging, the vein comes against the fault in such a way as to leave an edge which is farther to the northwest as you go upward—farther to the northwest as you go upward, and farther to the northwest as you go downward, so that the edge actually slightly overhangs and it is more like the overhanging or bottom part of this vein "XY" that I have represented upon that diagram than it is like the edge "MN."

Q. Have you made any mathematical calculations taking the dips and angles and strike of the Osborne fault and this vein to determine mathematically that question?

A. Yes, I have taken the course of the so-called apex as testified to in this course. I have taken the two testimonies as to the strike of that apex, one being north forty west and the other north forty-five west.

Q. Do you know at what point it ceases to be a

(Testimony of Andrew C. Lawson.)

top edge and begins to become a bottom edge?

A. I should say that it would cease to be a bottom edge—

Mr. GRAY.—Wait a minute; you did not finish that other answer.

Mr. DINES.—Pardon me, if I interrupted him. I [751—706] thought he was through.

A. I am willing to cut it off there. I am willing to say in regard to your last question that it ceases to be a bottom edge at the point where the so-called Osborne fault intersects the Clancy fault. There is a change; that is an angle, it is not an arc; it is an angle, and there you have a—

Q. I am not asking you that; I am asking you at what angle. A. You did not say so.

Q. When you have a fault similar to the Osborne fault with a well-defined strike and dip and you have coming in contact with that at an angle a vein that makes an angle with the Osborn fault on its strike and on its dip— A. Yes, sir.

Q. (Continuing.) —they are not the same, either in strike or dip— A. Yes, sir.

Q. (Continuing.) Have you made any mathematical calculations to determine at what angle or what point it ceases to be a top edge and begins to become a bottom edge? [752—707]

A. I would reply that it ceases to become a bottom edge where the line of intersection of the vein with the so-called Osborne fault intersects the line of intersection of the vein with the Clancy fault, and at that point you have an angle, not a curve; you have

(Testimony of Andrew C. Lawson.)

a distinct, angular, abrupt change from one to the other; necessarily mathematical considerations.

Q. That will be varied as the angle of strike and dip varies, will it not, that line of intersection?

A. It is a constant thing here.

Q. I am not asking you about this here. I say, the question of top and bottom edge will vary as the angle of strike and dip in your two dipping and striking bodies varies, will it not?

A. Are you talking about this particular case?

Q. No, sir. Will the reporter read the question to the witness?

(Question read.)

A. I am not clear as to whether you are discussing a general proposition.

A. I am discussing a general proposition for your purpose here. [753—708]

A. I will answer yes to your question then.

Q. It varies? A. Yes, sir.

Q. Now then, have you made any calculation to determine with reference to the general proposition, assuming different angles of strike and dip to both of these striking and dipping bodies, at what point it will begin to be a bottom edge or a side edge and stop being a top edge?

A. I have never considered a mathematical investigation necessary in this case; it is quite simple.

Q. I am not asking you whether you have ever considered a mathematical investigation necessary or whether it is quite simple. You have asked me if I was taking a general proposition, and I have

(Testimony of Andrew C. Lawson.)

asked you as a general proposition.

A. I have not made any.

Q. You have made none? A. No.

Q. So you are not able to state to the Court, taking these different angles that are made on the strike and dip by these two bodies at what point one will change from one to the other, are you? [754—709]

A. No, I never had any occasion to.

Q. Then, in making up your opinion as to whether or not the points where the Stewart vein terminates against the Osborne fault is a top terminal edge or some other kind of terminal edge, you have not made mathematical calculations of the angles between the strike and dip, is that correct?

A. I have made some mathematical investigations of that. They were simple, but I have relied upon the testimony given by witnesses in this case, that the course of the claimed apex which is the edge of the vein is according to one witness north 40 west and according to another witness north 45 west, and I have taken that information and find if that be so that it is an undercut edge, and that it overhangs; it is not the ordinary thing in the procedure down the dip in that vein from that apex.

Q. Will you give me what you took in your calculation; state it again?

A. I took the testimony of Mr. Clancy that the course of that apex represented on Exhibit No. 3 was north 40 west and the testimony of Mr. Green that the course of that same apex on that exhibit, the same line, red line, marked [755—710] the

(Testimony of Andrew C. Lawson.)

apex—marking the apex on that exhibit was north 45 west.

Q. Did you take anything else into consideration in making it?

A. I took the testimony as to the general strike of the vein.

Q. And you were speaking of the vein a moment ago, weren't you?

A. No, I was speaking of that edge of the vein. The strike of the vein is one thing and the edge of the vein is another.

Q. Yes. Now, the course of the apex in this case is not the course of the plane of the fault, is it?

A. No, sir; the course of what is called the apex is not.

Q. Will you tell me what mathematical calculation you made based on this data, give us some outline of how you proceeded, if you please.

A. Well, I took the general strike of the vein at north forty east.

Q. North forty east?

A. Yes, sir; that is the general strike of this vein [756—711] as near as I can get it, and if that be the strike of the vein and anywhere between north 40 west and north 45 west be the course of the edge of the vein against the Osborne fault, then the angle made by the strike, put it that way, the angle made by the strike of the vein with the edge of the fault is greater than a right angle, and the vein is overhanging—

Q. (Interrupting.) What course did you give to

(Testimony of Andrew C. Lawson.)

your Osborne fault; what strike do you give to that?

A. I did not consider that.

Q. You did not make any mathematical calculation, did you, then?

A. I told you I took your testimony for that.

Q. I say, you did not make any mathematical calculation based on that testimony, did you?

A. Well, there is not much mathematics to it.

Q. There is not? A. Not a great deal.

Q. Do you claim there is not mathematics in determining the lines of a geometrical figure that is made by your intersection before you can tell whether it is a top or bottom; is that correct? [757—712]

A. I will use another—

Q. (Interrupting.) I will ask you to answer my question, if you please.

A. What is the question? (Question read.) I did not deny mathematics entirely. I said there was not much. I would like to explain this matter.

Q. Explain all you desire to, Professor; I have no desire to chop you off.

A. Here is the course of the edge of the vein as it abuts against the Osborne fault; that is north 40 west to north 45 west according to different testimony. Now, the course of the strike of the vein is north 40 west and the angle between the edge of the vein represented by the red line marked apex on Plaintiff's Exhibit 3 is 100 degrees, if it be 40, and if it be 45 it is 95 degrees; that is to say, at an angle greater than 90 degrees.

(Testimony of Andrew C. Lawson.)

Mr. FOLSOM.—Indicate on that the position of the vein, that is, the dip of the vein.

A. The dip of this vein is in this direction.

Mr. GRAY.—In the direction of the arrow?

A. In the direction of the arrow on this diagram, and this is the edge; the edge of the vein with that [758—713] course is a very different thing from the strike of the vein.

Q. Is that all the data that you used in your mathematical calculation? A. What more do you want?

Q. I am not asking you that. I am asking you if you have stated to us all the data you used.

A. Yes, sir; that I have pointed out there.

Q. That is all I want to know. And did that enter into your calculation as the basis or a part basis, an element, of your opinion as to this not being the apex of the vein, the points that we have outlined on Plaintiff's Exhibit 3?

A. Yes; it indicates that this edge which is claimed as an apex on Exhibit 3 of the plaintiff is really overhanging slightly and is not even vertical.

Q. Will you point out on this model where that overhanging condition appears?

A. I do not know anything about that model.

Q. I am asking you to do that.

A. I do not know anything about that model.

Q. Well, I am asking you to do that; you have been [759—714] in there and seen the vein?

A. I cannot point it out.

Q. You cannot point out the overhanging condition that you refer to on this model?

(Testimony of Andrew C. Lawson.)

A. Not that model, I don't think so.

Q. Do these points here where the red comes up against the blue lines indicate to you—

A. I have not examined this model and I don't know anything about it.

Q. Well, you can take your time to examine it.

The COURT.—You can take your time.

A. (Witness examined model.) The reason that that does not appear clear in that model—

Mr. DINES.—(Interrupting.) I beg your pardon.

A. I say, the reason that that does not appear clear in that model, I have stated that I cannot do so, and I will explain that the reason that I cannot do so is—

Q. (Interrupting.) Well, first—

Mr. GRAY.—(Interrupting.) He has a right to explain.

Mr. DINES.—Certainly. Do not get excited, Mr. Gray. I will be glad to have the Professor make all the explanation he desires. [760—715]

Mr. GRAY.—Go on, Professor.

A. I will say in explanation, that the reason I cannot do as you have requested in this model is that this model is a representation of that abnormal portion of the vein that I alluded to in the early part of my testimony; that is to say, that it does not represent in my opinion thoroughly the strike and dip of the vein.

Q. Will you please point out anything—take that to pieces, if you desire, and point out a single plane in it that is not correct, a single angle there that is

(Testimony of Andrew C. Lawson.)

inaccurate, a single cross-section that is wrong; we will turn it open to you.

A. It may be for all that I know to the contrary a correct representation of the abnormal or deformed portion of the vein where it goes against the Osborne fault, but that is a very different thing from a representation of the vein in its entirety or in its general aspect. [761—716]

Q. Well, I understand you as stating to the Court that you take that apex of the vein as shown on this model, Plaintiff's Exhibit 15-A and Plaintiff's Exhibit 3, because you say it shows an abnormal condition of the vein, is that correct?

Mr. GRAY.—I object. The Professor says—

Mr. DINES.—That is the way I understand it.

Mr. GRAY.—I want to make my objection, if your Honor please.

The COURT.—Well, I'll overrule that objection.

A. I think you had better formulate that question so that I can answer it.

Q. If you did not understand it, I will try to do so. I understood you to say to the Court that you are unable to show the Court the apex in this model that you have referred to as overhanging, and you have refused to give the points that we claim the points of apex in this model, Exhibit 15-A and also Exhibit 3, for the plaintiff, because they show abnormal features of the vein, is that right?

Mr. GRAY.—I would like to make my objection, and call your Honor's attention to something in connection with this [762—717] question. It was

(Testimony of Andrew C. Lawson.)

not claimed by Mr. Frank that the red paint that he put on here represented accurately the connection of that vein with the Osborne fault; he told your Honor that he projected it in some places 110 feet along there.

Mr. DINES.—I beg your pardon.

Mr. GRAY.—You can do that too. And in other places it was not exposed except here and there, and that he had painted it up along this Osborne fault, believing that it was there, but he did not pretend to say that it was exactly as shown here; whereas there is in evidence the map which accurately shows the position between the two points, and which *goes* accurately give its course, and which would show whether or not it was an overhanging body.

(Objection overruled. Defendant excepts.)

Q. Is that correct?

A. Well, it is not quite correct, but my difficulty in answering your former question is that we have a condition of the vein there in which we see next to nothing of the true strike of the vein. I am referring to the model, No. 15-A. Now, that is a limited portion of the vein which comes up against the Osborne fault, and as I see it, it [763—718] does not represent the strike of the vein. Now, for that reason, having this deformed condition of curling up on the fault, which I discussed in the latter part of my testimony, it is difficult to say as to the overhang, and particularly as the dip that I spoke of is not its dip, but a dip at right angles to the general strike of the vein, which is not represented on this

(Testimony of Andrew C. Lawson.)

model. That is the mechanical difficulty in the situation.

Q. Well, you wish to change your testimony, then, to say that that is not because it shows abnormal features that you are unable to agree with us on the apex?

A. No, my testimony stands. I say that it is an abnormal portion of the vein, and I say positively that it is a change which has modified and deformed in the vicinity of the vein by reason of its abutment on the Osborne fault. Now, I think that is not a fair place to find the strike of the vein. You have got to follow the vein far from the fault in order to get the true strike.

Q. By the dip you mean a dip up and down a plane at right angles to the strike, or the true dip, do you?

A. That is what I mean, yes.

Q. You are not considering the question that that would [764—719] be a downward course?

A. Well, the downward course I think is generally understood to be the dip.

Q. Now, I will ask you from this point, and I am indicating Plaintiff's No. 15-A, the model, if from the point where that terminates against the Osborne fault, with the exception of the one point that you have designated heretofore, where it goes along the 300 foot level, if at every one of those points there is not a downward course onto the ore bodies of the Ontario from that point?

A. Yes, and I will explain in saying "yes" that there is the same kind of downward course that is

(Testimony of Andrew C. Lawson.)

found on this diagram from "Q" to "P," starting from the bottom of the vein and going somewhat further down in the vein, there is that kind of downward course, but it is not on the dip.

Q. And in estimating that kind of downward course, you are not able to state to the Court at what point it will cease to be the top edge and begin to be the side or bottom edge, can you?

A. Well, in regard to that question I would say that if we had a line like the line MN on the diagram, I suppose that might fairly be called a top edge, but when the [765—720] line MN gets in that position, then there might be considerable doubt about it, when it gets nearly vertical, and when it is actually vertical I should say it could not be a top edge, and when it passes that verticality it certainly could not be a top edge.

Q. Then your top is the 90 degree angle?

Mr. GRAY.—He didn't say so.

Mr. DINES.—I am asking him to say.

The COURT.—He certainly can ask him.

A. I recognize that there is a zone in here where there may be considerable doubt, when it approaches verticality, when the edge of the vein approaches verticality there may be a considerable doubt as to whether it is the side edge of a vein or the top edge of a vein, but when it gets over to a position such as the line MN is drawn on my diagram, there would not be much reasonable doubt, and when it gets below or the other side of the verticality there certainly could not be any reasonable doubt as to the

(Testimony of Andrew C. Lawson.)

fact that it is not an apex.

Q. Now, in taking your strike of the vein, are you taking the strike of it in the immediate portion where it comes in contact with the Osborne fault, or are you taking it at some other portion of the vein adopting some general [766—721] course?

A. I am taking the general course of the vein.

Q. Have you considered the course of the apex in determining the question of the angle?

A. The last question is not clear to me; I don't understand it.

Q. Have you taken the course of the apex of the vein or the course of *some the* body of the vein, in making this determination?

A. As regard the strike?

Q. Yes, as regards the side edge and top edge.

A. Why, that is a general diagram. I have not attempted to indicate there anything especial. I am not quite clear as to the meaning of the question.

Q. I mean in determining the question as to whether or not the line that is indicated in the model and in Plaintiff's Exhibit 3 as the line of the apex of that vein, have you taken into consideration in denying that proposition, the course of the apex of the vein or the course or strike of the body of the vein shown in the interior workings?

A. I have taken both.

Q. What has been your resultant? [767—722]

A. I have stated it here. Here it is in this diagram. I have even written it.

Q. I thought you just stated to us that that dia-

(Testimony of Andrew C. Lawson.)

gram is a general illustration.

A. I was pointing to this one. There are two diagrams on the one sheet of paper. This one is specific and that one is general. This is specific and has reference to this particular case. I think those should be marked.

First diagram to the right of the sheet of paper marked Defendants' Exhibit "G," and second diagram to the left of the sheet of paper marked Defendants' Exhibit "H."

Q. Now, Professor, directing your attention to the model, I will ask you to state if, taking the different points, all of them except the ones that you have indicated where there is some doubt, it may be a few feet one way or the other, they are continuous to the Ontario ore bodies from above; taking the further point whether or not, going down on the planes parallel to the end lines of the Stewart Fraction, you would not go on a downward course?

A. Yes, that is so, you would go downward, going to the Ontario ore bodies, and I would like to explain again. [768—723]

Q. I think you have explained it. Your idea is that it is not the character of downward course that I have shown.

A. Yes, I would like to explain that this diagram illustrates the kind of downward course that you have had in that case.

Q. Well, you have explained that. I *would* you would answer this question specifically. It is a downward course, isn't it? A. Yes.

(Testimony of Andrew C. Lawson.)

Mr. GRAY.—Now, you can explain if you desire.

A. I think I have explained it.

Mr. DINES.—I am entitled to a direct answer sometimes.

The COURT.—Certainly. The explanation has been already made and the Court understands it.

Q. It is also true, isn't it, that the line that is indicated on Exhibit 3 as the line of apex that we claim, does indicate the line of the terminal edge of that vein approximately correctly within the lines of the Senator Stewart Fraction?

A. I think so.

Q. We can agree on that, can we? [769—724]

A. Yes.

Q. It is only when you begin to classify the terminal edge that there is any difference between us; it is a terminal edge, and you can also agree with me, can you not, that it is a terminal edge along the line indicated on that exhibit which is close to the surface, as far as you can determine it from actual observation and the development work within the lines of that claim? A. I think that is so.

Q. You don't understand it to be the top or apex of a vein that has to be an outcrop on the surface of the earth? A. No, sir.

Q. You recognize the fact that a vein may have a subsurface apex? A. Yes.

Q. And you recognize the fact that the subsurface apex may be shown in a raise where there is an accumulation of the mass of the mountain, either wash or something else, on top of it, that it is the point

(Testimony of Andrew C. Lawson.)

in the subsurface apex where that apex comes nearest to the surface? A. Yes. [770—725]

A. Yes.

Q. And it would not make any difference whether this wash; we will say we have a subsurface apex 100 feet beneath the surface; it would make no difference as far as your testimony goes, as far as your experience reaches, whether the top of the vein is terminated by the wash or whether it is terminated by a fault?

A. It would not matter as long as we get the firm vein.

Q. Did you find firm vein at these points where you came in contact with the Osborne fault?

A. We found firm vein, and beyond it we found drag material, so that, in addition to the firm vein, we found some drag material.

Q. Did you see a condition—I show you Plaintiff's Exhibit No. 16. Did you find a condition at any one of the points that you found the contact between the Osborne fault and the Stewart vein like that?

A. I saw the very place where this photograph was taken.

Q. Is it not solid in there?

A. Yes, but this is not the dip of the vein, down here.

Q. I did not ask you that.

A. Well, that is solid galena. [771—726]

Q. You did find solid galena there?

A. That is vein there, yes, sir.

Q. Didn't you find galena at other places where

(Testimony of Andrew C. Lawson.)

you have identified the contact between the vein and the Osborne fault? A. Yes.

Q. You found the galena there not so *as* extensive as the one I showed you, but galena? A. Yes.

Q. You would not call that drag there, would you?

A. No, but there are fragments of galena dragged out into the fault breccia or gouge, that are characteristic of the vein.

Q. Yes, but that is where you find it, in the gouge?

A. Yes. I simply put it in as a reservation.

Q. You would never look for drag in any other place than in the gouge?

A. I think it would be in the gouge or the fault breccia.

Q. And you would call it drag when it is broken away from and is no longer in immediate contact or part of the vein, wouldn't you? [772—727]

A. Yes.

Q. Now, as this comes up against the wall you say that you don't find those conditions of broken ore separated far off from other parts of the vein?

A. We find this, that in drifting along on these levels, they sometimes go beyond the actual termination of the vein into the fault gouge, and in that portion of the drift we find pieces of galena scattered out as drag material in the breccia.

Q. You don't find much evidence of drag?

A. There is a good deal, yes, but I would discriminate, of course, between the bending of the vein and the drag of loose fragments, they are different things.

(Testimony of Andrew C. Lawson.)

Q. The bending portion there, is the point where the force has warped the position of the vein as it originally may have been, and the drag is where it is absolutely broken and separated from the vein, and you find it in the fault breccia?

A. That is right.

Q. Now, the Osborne fault in this case, is known to have had quite a vertical displacement?

A. I believe it is a large fault, yes; I don't know [773—728] how large, but it is a large fault.

Q. It is possible that it extended over many thousands of feet, perhaps a mile, in vertical displacement? A. It is entirely possible.

Q. So that whatever may have been the vertical formation of this vein as it was first put into the earth, those severed portions that existed and have passed away would be high up in the air, would they not, as it went down a thousand feet or more; they would now be entirely lost by the movement of the mass of the mountain over it?

A. Yes. There has been a very considerable separation of those two.

Q. So that a history of this vein extended over a very long period of time, hundreds of thousands of years? A. A very long time.

Q. Could you make any kind of estimate?

A. I would not care to put it in years. It runs counter to the geological instinct to put it in years.

Q. But you are able to tell, while you cannot give us a definite time, you are able to tell that it is very ancient. A. Yes, that is true. [774—729]

(Testimony of Andrew C. Lawson.)

Q. Do you find any evidence, the character of drag that you have just referred to, in the Clancy fault and the No. 11 fault that is shown on your cross-section? A. No, not that I recollect.

Q. Then you have correlated—I don't know that I quote you correctly; I don't know that you did correlate that, but you have shown on your cross-section simply a condition that that section showed, without any drag material between the face of the veins to enable you to identify them.

A. I think I did see some drag in No. 11 fault; I think there is a little drag in that.

Q. Did you find it in any quantity?

A. No, I did not.

Q. Did you find it in the Deering fault?

A. Not that I remember. I cannot remember any clearly.

Q. The fault that you refer to as going along the southern portion of this country and terminating the Stewart vein in its descent into the earth is a considerable fault, is it not?

A. It is a large fault, yes.

Q. And carried heavy gouge? [775—730]

A. A large amount of gouge, yes.

Q. Is it your opinion that that is an absolute termination of the vein at that point where it comes in contact with it?

A. It terminates it in the same sense that the vein on the other side does; the vein stops against it.

Q. In the Osborne fault you don't know what

(Testimony of Andrew C. Lawson.)

horizontal movement there may have been involved in that fault?

A. I think there was a large horizontal movement. I think the horizontal movement was very much larger than the vertical.

Q. And that may be a fault with a vertical displacement of many thousands of feet, now unknown, and an absolutely unknown throw as far as any horizontal movement is concerned, in such a fault you would not expect to be able to trace by any evidence of drag of a little vein that was disseminated over so extensive a country, to the other portions of that vein. A. No, I would not expect to do that.

Mr. GUNN.—With the permission of Court and counsel I would like to ask one question.

Mr. GRAY.—If he confines it to one question we will [776—731] consent.

The COURT.—Very well.

By Mr. GUNN.—Q. Professor, I understood you to say that this picture you have made on Defendants' Exhibit "C" represents an abnormal condition of a vein? A. Yes.

Q. And you spoke of an outcrop? A. Yes.

Q. And would you call that outcrop an apex?

A. I would call the outcrop an apex if the vein were continuous from the point C to D as it is represented in this diagram, yes.

Q. So that, although this may be an abnormal condition of the vein, that does not change the fact that the outcrop would be the apex?

(Testimony of Andrew C. Lawson.)

A. Apparently that would be the apex, I agree with you.

Witness excused.

Whereupon further hearing was adjourned until 2:30 P. M. of this day, Saturday, January 11th, 1913.
[777—732]

2:30 P. M. Saturday, January 11th, 1913.

[**Testimony of Fred W. Calloway, for Defendants.**]

FRED W. CALLOWAY, after being duly sworn as a witness for defendant, testified as follows:

Direct Examination.

(By Mr. GRAY.)

Q. State your full name, residence and occupation.

A. My name is Fred W. Calloway, I reside at Kellogg, Idaho; my profession is mining engineer.

Q. What school, if any, did you attend, and what experience have you had?

A. I studied and took the mining course, or began the mining course at the McGill University, Montreal, and afterwards was for two years at the University of Minnesota, Minneapolis. In 1899 I went with the class to Cripple Creek, Colorado, and I remained there a year and a half, practicing as a surveyor. In 1901 I returned to the University and studied during the spring and fall terms, and in 1902 I was assistant engineer on railroad work, on double tracking and division work out of St. Paul, and in the fall of that year I came west to northern Idaho, and I was engaged in the lumbering business for a

(Testimony of Fred W. Calloway.)

few months, and in 1902 I was [778—733] a draftsman in Spokane, and afterwards the same year was engaged in surveying in Sumpter, Oregon.

Q. What have you done since that time?

A. I think I am off in the years; I think that was 1903 that I was in Sumpter. In the fall of that year I went to West Virginia, where I was engaged in coal mining until 1906, when I again came west to Spokane, and a month later to the Coeur d'Alenes, to Wallace, I was assistant engineer with the firm of G. Scott Anderson & Sons until the fall of 1908, November, when I entered the employ of the Bunker Hill in connection with their litigation with the Federal Company, and continued in that capacity until April, 1910, when the settlement was effected. I have been practicing as a mining engineer and deputy mineral surveyor since, until I entered the employ of the Ontario Mining Company in connection with my private work.

Q. I will ask you if you have surveyed the workings beneath the Ontario mine on the level known as the Silver King tunnel level and below that?

A. Yes, sir.

Q. I will ask you if you have surveyed or superintended the surveying of the workings in the Stewart mine? [779—734] A. Yes, sir.

Q. I will ask you if the map, Exhibit "B" for identification, correctly shows the works of the Ontario and of the Stewart as it purports to show them?

A. To the best of my knowledge, it does.

Q. Have you marked on that map the various

(Testimony of Fred W. Calloway.)

workings so that they can be identified?

A. Yes, sir.

Q. You also have shown the outlines of the stopes in the Ontario above the Silver King tunnel level?

A. Yes, sir.

Mr. GRAY.—That is all I care to ask this witness at this time. I may desire to recall him later in the trial.

The COURT.—Very well.

Mr. GRAY.—I now offer in evidence the map, Defendants' Exhibit "B."

Map admitted in evidence marked Defendants' Exhibit "B," without objection.

Cross-examination.

(By Mr. DINES.)

Q. You speak of the outline of the stopes?

A. In the Ontario, I mean. [780—735]

Q. You refer to Exhibit "B"?

A. Yes, the Gray and the Frank stopes.

Q. Have you outlined any stopes in the Stewart?

A. We have surveyed several portions of those stopes and veins which are open at this time. Of course, the markings only represent the floors; they do not represent the whole stopes. We have no information as to that.

Q. Are the floors in those stopes indicated by the broken black lines that extend out from the red?

A. The solid lines on that map represent actual workings surveyed by me or under my supervision; the dotted lines represent workings that we have taken from the Stewart Mining Company's maps

(Testimony of Fred W. Calloway.)

that were introduced before in this case.

Q. You do not claim that on this map, Exhibit "B," you show all of the stopes in the Stewart Fraction ground?

A. No, sir, only those that we could get at. We had no other source of knowledge as to the stopes.

Q. Have you shown them from original surveys that you have made yourself, that is, the work on Exhibit "B"?

A. The work was my own, or done under my supervision.

Q. Have you compared it with the workings of the Stewart [781—736] Company, in the same property as shown by Plaintiff's Exhibit 1?

A. The maps are on two different scales. The Stewart map is on a scale of one inch equals thirty feet, and ours is on a scale of one inch equals fifty feet.

Q. I understood that, but have you compared them?

A. I have as nearly as I could without reducing one to the other. I think they are very close together.

Q. They are substantially in accord?

A. They are substantially the same.

Q. You think now of no particular point of discrepancy?

A. No, sir.

Redirect Examination.

(By Mr. GRAY.)

Q. The contour lines are also shown, and the lines of the claims on the surface, are they?

(Testimony of Fred W. Calloway.)

A. Yes, sir. The contour lines were actually run on the ground.

Witness excused. [782—737]

[**Testimony of William H. Herrick, for Defendants.**]

WILLIAM H. HERRICK, after being duly sworn as a witness for defendant, testified as follows:

Direct Examination.

(By Mr. FOLSOM.)

Q. State your full name.

A. William H. Herrick.

Q. Where do you reside?

A. At Wallace, Idaho.

Q. What is your occupation? A. Miner.

Q. How long have you worked as a miner and in what capacity?

A. Since the year 1887, and in all capacities from miner to manager.

Q. In what sections of the country?

A. British Columbia, the State of Washington, and the State of Idaho, and trips into the State of Montana.

Q. How long and what experience have you had in the Coeur d'Alene district?

A. I have been connected with mining chiefly in the [783—738] Coeur d'Alene district since the summer of 1900.

Q. What experience did you have in the Yreka district?

A. I started in as a miner in Yreka in the Last Chance, and was made shift boss for the Federal

(Testimony of William H. Herrick.)

Company and continued there for three years.

Q. I will ask you if you are familiar with the ore bodies and works within the Ontario mine and mining claim. A. I am to a certain extent.

Q. When did you first become familiar with them?

A. Why, I had a very slight acquaintance with them at a previous suit, the Ontario mining suit. I should judge that was about four years ago, but that was just a superficial acquaintance.

Q. And that involved other workings that are not now in controversy? A. Other workings, yes.

Q. Are you familiar with the workings in the Stewart mine? A. I am.

Q. When did you first visit those workings?

A. The first week in October of last year, for the purpose of testifying at the preliminary injunction hearing in this case. [784—739]

Q. What opportunity have you had to study them since?

A. Why, I spent all of the first week of this month chiefly going through the works of the Stewart and the Ontario Mining Companies.

Q. Will you describe the ore bodies in the Ontario mine with reference to their strike and dip, and refer to the plan map, Exhibit "B"?

A. I examined and went through very thoroughly several times the Frank stope and the Gray stope of the Ontario Mining Company. I find in those stopes from my observation of that vein, that they are on a vein having an approximate course of you might say north and southwest, or north 30 to 40 east and

(Testimony of William H. Herrick.)

south 30 to 40 west, with a dip at right angles with the approximate strike, southwesterly, and the Gray stope, was, you might say, just about the same condition, except the strike and dip might vary 5 to 10 degrees from that of the Frank ore body.

Q. Following the Gray and Frank ore bodies upward on their ascent, which direction do you go?

A. Northwesterly.

Q. In what direction from those ore bodies therefore would be found the top or apex of the ore bodies referred [785—740] to?

Mr. DINES.—I object to that as leading. The word “therefore” would indicate what was meant.

Mr. FOLSOM.—Well, I will withdraw the word “therefore.”

Q. In what *direct*, as a miner, would you look for the top or apex of those ore bodies?

A. Well, I don't think the top or apex of those ore bodies has been disclosed yet; they are still in commercial ore in the top of those stopes as you ascend on the dip of the ore body.

Q. I will ask you if you are familiar with the workings of the Stewart Mining Company; you said you were.

A. Yes, to a certain extent; not absolutely familiar.

Q. What is the general course of the Stewart vein, approximately?

A. Northeast and southwest, but a little more northerly than easterly or westerly; about north 30 to 40 east and south 30 to 40 west, that is, taking it

(Testimony of William H. Herrick.)

a whole as you traversed across the vein from one end to the other.

Q. I will ask you if any portion of the top or apex of the Ontario ore body is found in the eastern portion of the Stewart Fraction claim east of what is known as the [786—741] Siligo or Apex drift.

A. I don't know as I get that. You asked me if the Apex of these ore bodies is easterly of this point (indicating).

Q. Yes.

A. No, I think it is far westerly of that point, or southwesterly.

Q. I will ask you if any portion of the apex in your judgment of the Stewart vein lies easterly of the Siligo drift or southeasterly?

A. Why, not that I can see at all. I went along and saw the termination of the vein on its strike up against the gouge there. I should say that that would certainly not be easterly of that point.

Q. In going northerly from the Gray and Frank ore bodies, or northeasterly in the workings of the mine, do you ascend or descend?

A. Well, you go practically on a level. You go here on the 300 foot level, which breaks into the Gray ore body, and you follow that level right across, until you come to the other end of the vein up against the gouge; you don't ascend or you don't descend.

Q. In constructing work upon a vein, do miners usually [787—742] construct their drifts upwards? A. Not usually.

Mr. DINES.—We object to that. This case is

(Testimony of William H. Herrick.)

not to be governed by what miners usually do in the construction of their work.

The COURT.—I think the question is objectionable. I will sustain the objection.

Q. Do you find the levels in the Stewart mine driven as a rule along the course of the vein?

A. Why, as a rule you do, but of course there are flattenings in that vein where the tunnel or drift would be in the vein and yet vary in their direct course. When I tried to get the course of that vein I went up in the stopes right through, wherever accessible, and took the line of demarcation of the footwall of the ore to get the course of the ore bodies so that I would not make any mistake about the course of the drift, taking it in case it should not be in the exact course of the vein.

Cross-examination.

(By Mr. DINES.)

Q. How many observations did you make and at what places, to determine the course of the Stewart vein? [788—743]

A. Wherever I could get into working stopes.

Q. Tell us where.

A. I took it along through on—well, it would be a little above the 300 foot level where they are working in the northeast end of the vein at present, and I suppose it would be called the 300 stopes.

Q. Can you designate by points on Exhibit “B”?

A. No, I cannot, because in going in the stopes it would be pretty hard to designate your location in the stopes by a point on a drift or some place

(Testimony of William H. Herrick.)

where there is no direction.

Q. Can you tell between what points that is found?

A. No, that would be too confusing. That 300 drift has been stoped out above there. There is no drift there before.

Q. About what point of the drift then?

A. There is no drift there. The stopes have gone up through the drift and taken the drift out.

Q. Is that the best designation that you can give us so that we can know where you took those observations?

A. I can tell you that I took observations through this stope here, which is the stope over the Fir tunnel level. I do not see any points in that stope to mark it off. [789—744]

Q. Can you designate it on Plaintiff's Exhibit No. 1?

A. The stope is not marked on Plaintiff's Exhibit No. 1.

Q. Can you designate the point on the level above, or tell us the points where they are marked on that exhibit?

A. Well, you understand that I took many courses through there, and I might give a course at one point, and I might not get that point definitely enough so it would be approximately a course at another point.

Q. I understand, but you spoke of taking observations to determine the general course of this vein.

A. I did.

Q. In doing that you took certain observations that led your mind to that conclusion? A. Yes.

(Testimony of William H. Herrick.)

Q. All I ask you is to give us the places where you took those observations and what they were.

A. Well, I can start and tell you that I took observations right in the northeast end of the 300 stopes up against the gouge where it terminates there, and I went from these southwesterly on the course of the vein or stope, and took directions as I went along.

Q. And that was on what level? [790—745]

A. That would be just above the 300 foot level, in the 300 foot stopes. My first course would be almost east and west along that gouge, and then the stope turns materially and rather quickly as you go southwest, until you get courses from there at different points through the Frank and Gray ore bodies that were from east and west along that gouge to almost north and south in places along the south side line of the Stewart claim.

Q. How many observations did you take on that 300 foot level between the points that you first designated and the Ontario ore bodies?

A. I took them wherever I could get the observations along the footwall of the ore.

Q. Haven't you any notes of that or of any of them?

A. No, sir, I did not keep any memorandum.

Q. You never kept your notes? A. No, sir.

Q. What did you do, then, when you found your different courses or strikes at different portions of it, what did you do then?

A. When I took these courses I had the maps of

(Testimony of William H. Herrick.)

the workings and took those courses to verify the courses on the maps in my own mind, so that I was not taking someone else's [791—746] courses, but was endeavoring to verify them myself.

Q. Then the object of your visits and the taking of these observations was to determine whether the course of the level on the working map was a correct course of that level, was it, the 300 level?

A. No, sir, I was endeavoring to get the exact condition of affairs. That was a guidance to me, and I was trying to verify it as I saw things in the ground.

Q. Did you take in determining the course points on the footwall of the vein, and on the hanging-wall of the vein or in the body of the stopes, the body of the vein?

Mr. GRAY.—He has answered that three or four times.

The COURT.—He has answered it in part, but I don't think he has answered all of the question.

A. The greater part of the observations, and I might say almost all of the observations were along the footwall, because there the line between the ore bodies and the footwall quartzite is more clearly marked in the veins of that district than any other part of the vein.

Q. Now then, did you average the different results that you have taken in that way?

A. As I told you, I verified the course on the map, [792—747] which showed a quick turn near the gouge on the northeast end of the vein, and then got

(Testimony of William H. Herrick.)

irregular courses which approximately were the courses shown on Plaintiff's Exhibit 1 and Defendants' Exhibit "B."

Q. You did not add these together, and take an average? A. No, sir.

Q. You did not draw a point, when you were trying to get the general course from the extreme points, showing different courses?

A. I did not. As I verified the map of course I did it the same as I can go to this map now and show you what I consider the general course. [793—748]

Q. Now, you were asked about the apex of the vein. I understood you to say when the question was first asked you that the apex to the Ontario ore bodies is at some point that has not been disclosed; is that right?

A. In my opinion it is exactly right.

Q. It has not been disclosed yet? A. No, sir.

Q. Then in the latter portion of your testimony you said the top or apex of the Ontario was far to the westerly or southwesterly?

A. That must have been westerly or southwesterly of some point, Mr. Dines.

Q. I think I quote you *verbatim*; I am trying to do that.

A. There must have been a question before that.

Q. You said the apex had not been disclosed, and you said that the top or apex of the Ontario was far to the westerly or southwesterly.

A. Of some point.

The COURT.—I think he said northwesterly.

(Testimony of William H. Herrick.)

Mr. FOLSOM.—No, the witness is right and Mr. Dines is wrong. [794—749]

Mr. DINES.—I submit that to the Court, or if the Court cannot remember I will ask to have the testimony read by the stenographer.

The COURT.—The stenographer may read the testimony.

(Testimony read.)

Mr. DINES.—I don't think I quoted the witness wrongly. I think Mr. Gray should be a little more careful in his remarks.

Mr. GRAY.—Well, he said southwesterly of a certain point.

The COURT.—Q. Is that the way you wish to be understood?

A. Well, I wish to be understood that the apex of these ore bodies is away up in here, and not away down in here away over across the country.

Mr. DINES.—Q. But you still wish to affirm, as you did in the first portion of your examination, that that apex has not been developed, and your theory is that that apex has not been disclosed by any actual workings upon the ground or anything that would enable you to definitely ascertain that apex?

A. Certainly, sir, because we are ascending on this [795—750] ore body and we have not reached the top of that ore body here to indicate the top or apex of the vein.

Q. You have spoken of ascending in the direction to the northwest of the Frank ore body in the Ontario? A. Yes.

(Testimony of William H. Herrick.)

Q. I will ask you if you were to go on the vein, if the workings were open on the Stewart vein right through to the apex claimed by the plaintiff near the Siligo or Apex tunnel as shown on Exhibit "B," and following down to this point here where my pointer now is, the back of raise No. 218 east if you would not also ascend on the vein from the Ontario to that point.

A. Well, you could come across here on a level, and then you would run off on the edge incline to the Siligo.

Q. Yes, but assuming that that way was all open, if you would not ascend in going from the Ontario to that point?

A. It all depends on which way you hold your ruler there. You would certainly turn.

Q. Take it first to the point along here to the tunnel. You certainly ascend that far?

A. Yes, that is a higher elevation. [796—751]

Q. And now take a point in the Siligo or Apex tunnel, and would you not ascend to that point?

A. Yes. [797—752]

Q. And going on to the next point, I will ask you if you would not ascend?

A. I don't know anything about that.

Mr GRAY.—Where is that?

Mr. DINES.—That is between the breast of the Apex tunnel drift or Siligo tunnel drift going in an easterly direction, about, I will say halfway, I will put the point halfway between that and raise 218 E,

(Testimony of William H. Herrick.)

the top of raise 218 east; I will ask you if you would not ascend?

A. This portion that your ruler passes through on this level would be higher than this stope; of course, this point that you point to I don't know anything about.

Q. I am asking you if there was any direct connection from this ore body on the vein to that point, wouldn't you, in going from that point to any of these points, ascend?

A. You are giving me optional points, and there is some of them that I don't know anything about.

Q. I relieve you of all responsibilities, I will place it all on myself. Take between the Apex drift and the top of raise 218 east, halfway between, and I will ask you if the Stewart vein were opened up to that point [798—753] on the line shown on my ruler by a direct connection or working on it, if you would not ascend? A. I would.

Q. I then come to the top of raise 18 east and ask you the same question; would you not ascend?

A. Yes, sir; it is a higher elevation.

Q. I then come to the end of raise 218 east and ask you if you would not ascend? A. Yes, sir.

Q. I then come from the foot of raise 218 east on a direct line to the end line, the easterly end line of the claim and ask you if you would not ascend?

A. Very little. You are getting down to where you have a very few feet.

Q. Yes, sir, but there would be some ascension, would they not?

(Testimony of William H. Herrick.)

A. A *very* feet; I don't know exactly.

Q. But there is an ascending course of a few feet there?

A. Yes, sir; but you go a little further and you go down.

Q. If you took lines parallel to the east end line of the claim— [799—754] A. Yes, sir.

Q. I show you one line that I project supposed to be a vertical plane parallel to the easterly end line of the Senator Stewart Fraction claim, projected through the foot of raise 218 east, and ask you if a direct line of communication were opened up between the ore bodies under the Ontario and that point, if you would ascend in going from that point to this point? A. You would.

Q. I now come to the top of the raise and still parallel with my end line, and ask you?

A. You would.

Q. Then parallel to my end line I take the set point to which I directed your attention, between the face of the Apex drift and the top of raise 218 east, and ask you if there would be an ascension?

A. There would.

Q. Then you do not intend the Court to understand you that by the mere fact of ascending along the working which happens to be driven in a northwesterly direction, that that alone enabled you to fix the apex in the westerly or northwesterly direction? [800—755]

A. No, sir, but I do mean to say that the shortest course on the ascension to the top of that ore body

(Testimony of William H. Herrick.)

would be to the apex, not the longest ascension away off at a tangent.

Q. Are the Ontario ore bodies a part of the Stewart vein?

A. I think so; I do not think there is any doubt of it.

Q. You think they are one and the same vein?

A. I think they are, yes, sir.

Q. Did you go up raise R 2 west? A. Yes, sir.

Q. On the southerly side line of the Stewart Fraction? A. I did.

Q. Did you find there the termination of the vein, of the Stewart vein, as it approached the nearest surface?

A. I would not wish to say. I went up to the top of that raise and there was quartzite in the raise and just behind the timbers there was a gouge.

Q. Did the gouge seem to stop the further upward course of the vein at that point?

A. I would not attempt to say. [801—756]

Q. You do not know?

A. I know what it is supposed to do, but I do not know from my own—

Q. (Interrupting.) Well, what is your best judgment and opinion on it? You are testifying here to the apex; now, what is your best opinion, does that vein stop against the gouge as shown in raise 2 W or not?

A. I think undoubtedly in the course it is taking there that it stops there; whether it goes on at another course, I don't know.

(Testimony of William H. Herrick.)

Q. How far are you beneath the surface at the top of that raise?

A. As I understand, it is very close, probably one hundred feet, probably less than one hundred feet.

Q. Even if it were extended beyond, it would very shortly come to the surface in its own course in the upraise, wouldn't it?

A. Yes; it would unless it was broken and thrown in another course.

Q. And that you are not able to say? A. No.

Q. You found stoping done between this raise and the [802—757] Deering crosscut; you went in a general north 30 to 40 degrees east, did you not?

A. Yes, sir, stoping.

Q. Are those stopes continuous?

A. Most of those stopes are not accessible, I guess; there are very few of them accessible.

Q. You found the stoping done there, did you not?

A. Yes, sir, indications that there had been stoping there—chutes.

Q. You are satisfied that the Stewart vein has been there? A. Yes, sir.

Q. And those stopes are a part of the workings on that vein? A. Yes, sir.

Q. Have you ever been up in any of those stopes?

A. In a very few. I think there was one raise there that went up into a small stope; I am not certain of it, and I would not care to get right down to too close a point.

Q. Do you think, from what you saw in there, that the part of the vein nearest the surface as you go

(Testimony of William H. Herrick.)

north [803—758] thirty to forty degrees east is within the lines of the Senator Stewart Fraction or not? A. I do not know as I got that correctly.

Q. Kindly read it. (Question read.)

A. Yes, sir.

Q. You think it is? Is that true of that vein until you come up to what is called the Siligo tunnel on Exhibit "B"? A. Yes, sir.

Q. And called the Apex tunnel on Exhibit 1 of plaintiff's? A. I think it is.

Q. You think that is true? A. Yes, sir.

Q. Did you find a vein in this Apex tunnel?

A. I am not a geologist, Mr. Dines, and things are rather mixed up in that tunnel, and I do not care to qualify any particular statement about what is in that tunnel.

Q. I will say to you now that I am not going to ask you any difficult geological questions at all; I am simply asking you from your experience as a miner, did [804—759] you find a vein in that tunnel?

A. Yes, sir; we found a vein probably going along through that fault or gouge or something and it looks as if it might be a vein near the surface.

Q. You found a fault in the western portion of it, down here near where what is called the Clancy fault comes in? A. Yes, sir.

Q. Now, in going on easterly or northeasterly to the point where the tunnel comes into that, were the workings on a vein?

A. Yes, sir; I examined a stope underneath that.

Q. The workings of the tunnel itself below the

(Testimony of William H. Herrick.)

footwall of the vein?

A. Well, what looks to be the footwall, it goes along the footwall.

Q. If you had been mining yourself in there you would have taken that for the footwall of the vein, wouldn't you?

A. Very likely, yes, sir.

Q. And as you go on past the point where the up-raise comes in and on to the face of the drift as far as you saw it, state to the Court, if you please, whether or not [805—760] that was all on a vein.

A. I would not say that it was.

Q. What portion is not?

A. There is a broken-up condition here as you approach the northeast end of the main drift.

Q. That is, you mean this portion here where it seems wider on your stope?

A. That is caved in right there; it is wider there.

Q. Is it about there that the Osborne fault is disclosed that you noticed the gouge or fault, right there at that point?

A. I would not care to say that it was the Osborne fault.

Q. What kind of vein material; I do not mean to classify it geologically, but compared to the commercial ore, the galena that is shipped here; did it appear to be a solid vein or a vein that was approaching the surface, the top part of it?

A. Well, it had the appearance of both; you might say it was a vein there; and you might say it was disturbed by surface conditions.

(Testimony of William H. Herrick.)

Q. Did you go into the raise that goes from the [806—761] stopes below on up through the tunnel to the surface? A. I did not get in that raise.

Q. So you do not know what that discloses?

A. No, sir.

Q. How did the portion of the vein that you see at the wall here in the portions that you have testified to compare with the appearance of the vein at the tops of these stopes or any of these stopes that you see where you get outside of the commercial ore?

A. You could get a better idea of the stoping here than you could down in through here. This stope here seemed to be a regular little stope.

Q. Did you notice a place here where it caved right down both west and east, west of the portion of the tunnel west of the portal of this crosscut, and east of it, where the vein had caved right in down on the stopes? A. Yes, sir; there are those places.

Q. That is a pretty good indication that you are right at the— A. —top of the stoped ore.

Q. (Continuing.) —top of the stoped ore; and the vein was right there near the surface, wasn't it? [807—762]

A. I don't think there is any doubt of it.

Q. Then you would be able to tell the Court, wouldn't you, that in those workings as far as you could judge that you had disclosed the top of the Stewart vein as it approached the surface or nearest the surface?

A. One part of the Stewart vein; it is not the top of the Stewart vein, a portion of the top.

(Testimony of William H. Herrick.)

Q. A portion of the top of the Stewart vein?

A. Yes, sir.

Q. Yes, sir. There are stopes in here a very short distance of the tunnel, above, are there not?

A. Yes, sir, just below.

Q. Just below? A. Not very far.

Q. When you come to the raise, you find in that raise the top of raise 218 east— A. Yes, sir.

Q. The vein disclosed lying against the Osborne fault, do you not? A. I don't know.

Q. Do you find a vein lying up against—

A. (Interrupting.) Some gouge matter. [808—763]

Q. (Continuing.) —some gouge matter; you do not know what the gouge matter is, but you remember of there being a vein there?

A. I don't know that it is the Osborne fault, because I did not see enough of it to say it was the Osborne fault.

Q. I understand. Now, I will ask you if that part of the vein was as near to the top as you could go in going up to your northerly side line or going up to the surface, was there anything there that would show any higher top or any higher part of the vein, if you prefer that term, than was seen in that upraise?

A. I consider this a higher part of that vein.

Mr. GRAY.—The Siligo tunnel?

A. The Siligo tunnel.

Mr. DINES.—Q. Yes, sir; it is higher, no doubt about that, but I am asking you now when you get

(Testimony of William H. Herrick.)

to right at this point, confining your attention to the vein as it is shown there in the top of that raise?

A. Yes, sir.

Q. Could you go any higher on it?

A. Yes, sir, go higher going up to this apex in the Siligo tunnel. [809—764]

Q. No, I mean this way, could you go up any higher on it in a northerly direction?

A. I don't know; you might have to go through the gouge there to get to it.

Q. You do not know that there is any vein beyond the gouge there? A. No, sir.

Q. Did the vein terminate at that point?

A. It certainly did.

Q. It certainly did? A. Yes, sir.

Q. How was it along the raise, was not that raise all on vein?

A. Yes, sir; that raise in part connects with the stope.

Q. How was that? Was there any higher part over that, I am not referring you now to the part going back on what we call the course of the apex, but was there any portion of the vein at that point that you could follow in going on a line parallel to your end lines than is right there in that raise?

A. No; that is the end of the vein. [810—765]

Q. That is the end of the vein there?

A. Yes, sir.

Q. And how about at the point where that vein crosses the end line of the claim, of the Stewart Fraction claim?

(Testimony of William H. Herrick.)

A. That is right about where the ore peter's out going to the northeast there, is in that stope.

Q. Could you going along up the end line or going along on the vein parallel to the end line go any further up?

A. There is a little ore shown in this 314 raise, just a small amount at the bottom.

Q. But that is before you cross; I say, at the point of crossing.

A. This raise does not cross the end line.

Q. But here it crosses? A. That is a stope.

Q. That is a stope? A. Yes, sir.

Q. Can you go on that body that is disclosed right in the stope?

A. Go any higher outside the vein?

Q. Go any higher either on the end line or on a [811—766] plane parallel with the end line?

A. No, the end line represents the end of the vein.

Q. You have had a good deal of mining experience as manager of mining properties, haven't you?

A. I have never managed any large properties.

Q. You have been in litigation and studied veins that far?

A. I have studied conditions as far as a miner would usually study them.

Q. Is it unusual to have one point in an apex as you go along the course of an apex lower than another point?

A. It would be rather unusual to have the apex all on the same level.

Q. You think it would. Take an apex crossing on

(Testimony of William H. Herrick.)

the side of a steep mountain—

A. I say it would be unusual to have the apex all on the same level.

Q. I misunderstood you. Then it is quite usual to have some difference in elevations between the points of the apex as you go along the course of the apex? A. Certainly.

Q. I will ask you to look at the model that is here [812—767] on the desk and designated as Plaintiff's Exhibit 15-A— A. Yes, sir.

Q. And please state if that fairly represents as far as you could determine it and as far as it purports to represent the way that vein twists and turns in going to the Osborne fault?

A. No, I would not care to say that that represents anything to me; I don't know anything about that model.

Q. Were you not with them the other night when they took it apart and studied it?

A. I was in here a few minutes, but I had nothing to do with it.

Q. Didn't they take the sections out and make a careful measurements to see if anything was wrong with it?

A. I believe sections were taken out, but what they did with it, I don't know anything about it.

Q. They were here measuring it and studying it?

A. I don't know anything about that.

Q. Weren't you with them?

A. I was here a few minutes that evening. I know the model was taken apart, but what was in it I don't

(Testimony of William H. Herrick.)

know, I don't profess to know, because I had nothing to do with it [813—768] whatever.

Q. You have made mining locations, haven't you?

A. I do not think alone and unassisted I ever made a mining location.

Q. Well, you know about—in a general way, you have assisted in them,—have you made surveys of them?

A. No, I have done prospecting, but I had a partner who did the locating; I was not with him. I have never located a mining claim in my life.

Q. I will assume a case to you that you need to take no responsibility as to the hypothesis that I make. I will assume that for you. I will assume that there was a vein the course of which at its apex, the course of the apex is as shown here through its Siligo tunnel and all of it connected together, shown on Plaintiff's Exhibit 3; I will assume that there has been an erosion of the side of the mountain, and that the vein is eroded; originally it was about as I put my pointer on a level, the points of apex on a level with this, that by erosion it was worn down until that edge of the vein in that triangle was dissipated and gone and it left this part of it; would you say that the cause of the erosion that had [814—769] taken away the upper portion of it, that it was any less an apex than it was when it had the straight course out there?

A. I would not say the erosion affected the apex any more than it affected the end boundaries of it.

Q. It would still be an apex?

A. No, I did not say that; I said I do not think

(Testimony of William H. Herrick.)

that the erosion would affect the apex any more than it would affect an end boundary.

Q. In other words, if the point I assume was correct and that line was a straight line in a direct easterly course to the end line, and is an apex, and by erosion it was worn down that side of the hill until it appears as shown in Exhibit 3, it would not be any less of an apex because this point up here is more than this point here, would it?

A. That is just a supposition on your part, and I would like to get a supposition that would give me something to go by.

Q. You have stated the apex of this vein now, and I am asking you if you would consider it to be any less of an apex because it was worn down in that way. [815—770] A. It would not.

Mr. GRAY.—You are referring to a miner's apex and not a legal apex.

Mr. DINES.—Yes, sir.

A. I am testifying to the conditions as I saw them.

Q. I understand. Now then, assuming it is worn down by erosion to the condition that is shown on Exhibit 3, the portion extending from the apex to the easterly end line, and that you as a miner, having seen some outcrops up here on the hill were led to sink a shaft, but you struck that ore there as you went down from the surface with your shaft, would you think you had the top of the vein?

A. I would not know until I had done work enough on the vein to determine that for me. I would not try to determine it from one little shaft.

(Testimony of William H. Herrick.)

Q. You would not think it was less an apex because there had happened to be some point up here on the course of the apex that was a higher point?

A. No, but if in this case, as you say, I sink here and got an apex and I drifted along here on the vein, I would then call this my apex up here; I would [816—771] not call that an apex at all.

Q. You mean you would call this edge over here an apex?

A. Yes, sir, I would call this edge over here an apex.

Q. That would be assuming contrary to my supposition. I said that it had been originally this way and worn down to that point?

A. I would not care whether it was this way or that way; if a vein laid that way and I drifted across that way, it would make this the end.

Q. Do you say the vein lies that way?

A. Which vein?

Q. The Stewart vein that we are referring to; do you say the Stewart vein lies that way?

A. Which way?

Q. This way.

A. I say the Stewart vein lies this way, yes, sir.

Q. That is, by this way you mean what, what course?

A. Approximately north thirty to forty east and south thirty to forty west in that vein as I saw it lying in that hill. [817—772]

Q. Isn't it true, if you take these levels of the workings inside of the Stewart Fraction, that they

(Testimony of William H. Herrick.)

show as you go along toward the end line a decided tendency of the vein to bend around in the form of a crescent toward that east end line?

A. Yes, I told you that I took a course east and west.

Q. Now, answer my question. A. Yes, sir.

Q. That is right. Then you would not in this case find a vein clearly lying up one way, as you indicated it with your pointer, that is north thirty to forty degrees east, would you?

A. No, I said the course of that vein for the greater part of the vein is disclosed from the south side line of the Ontario up to the fault, is mostly that direction until you get near the fault.

Q. And there are points in the body of that vein as you go into it where you cannot distinguish course from dip, isn't that true?

A. I don't know as it is.

Q. Take the flat places in that vein.

A. Yes, sir, up in the old lower Stewart tunnel.
[818—773]

Q. You cannot tell strike from dip?

A. I would not say that.

Q. I ask you if that is not a fact on these curves?

A. Well, if the course of the vein is flat any place it would be hard to say which is which; of course, you could take any course you wish to.

Q. There seems to have been a decided bending and mixing up in the body of that vein in there by some disturbance, does there not? A. Apparently.

Q. You testified, did you not, Mr. Herrick, or made

(Testimony of William H. Herrick.)

an affidavit in this case on the preliminary injunction? A. I did.

Q. I will ask you if you did not use in that affidavit the following language, "there is no connection on a vein or on ore between the workings in the east end line of the Senator Stewart Fraction claim and the ore bodies in the Ontario claim." I call your attention to the language you used.

A. Yes, sir; I probably did. At the time I examined these workings the Gray stope was not connected with the [819—774] 300 west drift.

Q. Do you know when that connection was made?

A. No, I don't. I say it was not connected because I was not able to see it, or supposed it was not connected.

Q. But there was a connection between the Frank ore body and the other at that time?

A. Yes, sir, but there was a fault that you had to go through, waste matter in the drift or crosscut to get into that.

Q. Is that what is designated here as fault No. 11?

A. I believe that is it, yes, sir.

Q. You did not believe at the time you made this affidavit before his Honor that the ore bodies beneath the Ontario surface were part of the Stewart vein at all, did you?

A. I did not examine it thoroughly enough at that time in order to have a decided opinion on the matter at all; I simply said—

Q. (Interrupting.) You said there was no connection? A. No connection on ore.

(Testimony of William H. Herrick.)

Q. But there was, you say, this connection on ore?

Mr. GRAY.—No, he did not. [820—775]

A. No, I say that connection was broken by a fault.

Mr. DINES.—Q. By a fault? A. Yes, sir.

Q. What connection was there at the time?

A. Yes, sir.

Q. What is it that has made you change your mind since then and you tell his Honor now that you do think these ore bodies in the Ontario are part of the Stewart vein?

Mr. GRAY.—I object to that question; it is not fair. He did not say it was not at that time; he has not necessarily changed his mind.

The COURT.—I understand the witness thoroughly. It is not unfair to me; I understand him.

Mr. DINES.—I do not wish to be unfair to the record. The question comes up, your Honor, whether he says—and I am perfectly willing that he should have full opportunity to explain—

Mr. GRAY.—The objection has been overruled.

Mr. DINES.—One moment, please, Mr. Gray, I am addressing the Court now and I prefer not to be interrupted. —there is no connection on a vein or on ore between the workings in the south end of the Senator Stewart Fraction [821—776] claim and the ore bodies in the Ontario claim. Now, the word “connection,” if the witness meant there that it was a working on ore, would be one thing, but the word “connection” bears a conception at least of saying that there was absolutely no connection at all between

(Testimony of William H. Herrick.)

those ore bodies and that vein. Now, a physical connection, that is, a working underground is one thing, and the connection that is put here is another; it is on that, that I wish to interrogate him.

The WITNESS.—Mr. Dines, I do not think I would say there was no working connection when I went through the connection myself from one place to the other.

Q. You must have meant that that was not a part—

A. (Interrupting.) That the ore was not continuous where I went through from one to the other.

Q. Did you mean to be understood in that affidavit that the ore was not a part of the Stewart vein?

A. No, sir; I did not mean to be understood on anything except what I said.

Q. Now, you said you went in ascending—if I quote you correctly, and you correct me if you do think I do not quote you fairly— [822—777]

A. Yes, sir.

Q. I understand you to say that in ascending from your Frank ore body to the westerly part that you took that way because it was the shortest connection. Now, was I mistaken or not?

A. Took which way?

Q. That you took the way to the northwest looking for an apex to the northwest because it was the shortest connection?

A. I said in ascending you would ascend on the stope, take the shortest way to the top of that stope.

Q. That is the reason you took it that way, simply because the workings were shortest that way?

(Testimony of William H. Herrick.)

A. I took it because it was at right angles to the stope.

Mr. DINES.—That is all.

Witness excused.

Thereupon an adjournment was taken until 10:00 o'clock, Monday morning, January 13, 1913. [823—778]

Monday, January 13, 1912.

[Testimony of Walter H. Wiley, for Defendants.]

WALTER H. WILEY, after being duly sworn as a witness for the defendant, testified as follows:

Direct Examination.

(By Mr. FOLSOM.)

Q. State your full name. A. Walter H. Wiley.

Q. Your residence. A. I live in Los Angeles.

Q. What is your occupation?

A. That of a mining engineer.

Q. How long have you followed that line of work and what preparation did you have?

A. I graduated in 1883 from the Colorado State School of mines. Prior to that time I had worked as a miner. Since 1883 I have been continuously engaged in my business.

Q. I will ask you if you are familiar with the vein in the Yreka mining district, Shoshone County, Idaho? [824—779] A. With a portion of them.

Q. One more question with reference to qualification. What experience have you had in the examining and operating of mines in a little more detail?

A. Well, for the past thirty years I have been con-

(Testimony of Walter H. Wiley.)

tinuously engaged as a miner or mining engineer, and during that time my work has taken me over the greater part of the Western United States, including trips into Alaska, British Columbia and the Yukon territory, into a number of the States of Mexico, into South America and Asia.

Q. Well, how much time have you spent in the Coeur d'Alene district altogether, particularly the Wardner end of the district?

A. The total time would aggregate several months in the Wardner-Kellogg section.

Q. I will ask you if you are familiar with the vein or vein and ore bodies in the Ontario mine involved in this litigation and the veins and the ore bodies within the Stewart mine adjoining it? A. I am.

Q. Will you tell the Court in your own way, using such models and cross-sections as you have prepared, [825—780] what relation the ore bodies bear to each other and to the claims where their tops or apexes, are, and such other matters as may assist the Court in determining the controversy?

A. The plan map which has been introduced as Defendants' Exhibit "B" show the workings on a scale of fifty feet to the inch. It is necessarily a horizontal projection, on which all the workings are shown upon one plane, with the idea of making the relative position and the conditions of the workings clearer, we have had constructed on the same scale as the map a model which shows the workings the same as the plan map but at their correct relative elevation. The map upon the base of this model is

(Testimony of Walter H. Wiley.)

the same as Defendants' Exhibit "B." The skeleton framework above this map is simply a representation of these various workings at the proper elevation, each working on the model being shown above its position upon the map at the base, and at the elevation which it actually occupies in the earth. The drifts and raises are shown by this model, which has been painted three different colors. The gray color represents the country quartzite, the red the veins, and the blue the faults. [826—781]

There are numerous small faults throughout this section which are not shown; there are also numerous workings between the levels, stopes, which are not shown; they are to-day inaccessible, and we had no data whatever to represent them. In certain places stopes are shown as the sill floors where the levels are widened. The two ore bodies in dispute, those of the Frank stope and the Gray stope of the Ontario Mining Company are shown in their entirety as they were at the time of the survey. The top of this model shows the surface of the ground, the green lines representing the contours corresponding to the contours on the map, the actual elevation being marked by the letters and figures upon the green. The base of the model is placed at an elevation of 2,200 feet, so that, to determine the distance from that base to the surface, if we take the highest contour, 3,850 feet, we have a total vertical range of 1,650 feet between the base of the model and the top.

The ore bodies in the Frank and Gray stopes of the Ontario Mining Company are situated vertically be-

(Testimony of Walter H. Wiley.)

neath the surface lines of the Ontario at a distance varying from 600 feet at the top of the Gray stope to nearly a [827—782] thousand feet at the bottom of the Frank stope, this difference in elevation being caused largely by the fact that the country rises rather steeply in a southwesterly direction. The north upon this model is, as shown upon the base, square with the side line at the base of the model.

These stopes, the Frank and the Gray, are separated in the mass of the earth, as shown by their separation upon the model. A scale of fifty feet to the inch shows the separation to be about 140 feet at the nearest point of approach of these ore bodies. In going upward from these ore bodies the top immediately above the ore at a higher elevation has not been developed; the ore bodies are continuing on their upward course in the ground as far as at present developed, with the exception that between these ore bodies there is a fault which has been called No. 11 fault, and the upward ascent of the Gray ore body is interrupted by this fault, which lies between the two, the fault dipping to the south at an angle of about 30 degrees so as that we go upward on the Gray body we must go further north in order to continue the ascent beneath that fault.

The only fault which is shown there, that is, by the [828—783] blue coloring at different points upon the levels, is what has been called the Osborne fault. This is the largest fault of the lot, and it is shown by the sheet of blue celluloid, this being fastened to the levels at the point where it is actually

(Testimony of Walter H. Wiley.)

developed, and the resulting warped surface showing substantially the location of this fault. It extends, of course, deeper into the earth, and also in every direction, beyond this sheet, and the representation is limited to the portion which is developed, and where we know its exact, or nearly its exact location.

By following the red color upon this model we can see the connections in ore from the Frank and the Gray stopes with the workings above. From the Frank stope we can go through a portion of the 300 foot level of the Stewart mine up through raise 328 east, to the 200 foot level, and from that through raises and stopes, through raise 223 to the lower Stewart tunnel level. In following through these raises we go through rather irregular workings, in many places closely timbered, sometimes a raise for a short distance, then a nearly horizontal working, and on account of the close timbers I have not been able to trace the vein at every point through this work, and my knowledge of [829—784] what there is in these raises at some point is necessarily an inference from what I see above and below the portions which are tightly timbered, but I fully believe that these raises and the various workings do follow continuously upon the vein from the Gray and from the Frank stopes to the Stewart tunnel level.

The lower Stewart tunnel level itself is very badly caved. There is a considerable portion of the level itself which is not at all accessible, and the red color through those portions where it is represented as upon the vein is based again upon a belief, simply, that the

(Testimony of Walter H. Wiley.)

vein extends through those portions. We see it to the south of this caved portion and we see it to the north; we have had the plaintiff's exhibits showing stoping through that section, but I have no reason whatever to doubt that the vein is entirely continuous on the Stewart lower tunnel level through that portion, although I have not been there at all myself.

Above the lower Stewart tunnel level we have several raises which are accessible generally, extending at varying heights above. These raises which are colored, five of them—or six, including raise No. 4 east, are all [830—785] to-day accessible, but the timbers are very badly crushed. The most southerly one at the end of the Stewart tunnel level is up about 150 feet, and is continuously upon the vein, and the vein shows at the top, still upward; there is ore actually in the top of this raise, but of low grade, and poor ore which probably would not pay at that immediate spot to mine. North of this, at a distance of about 200 feet, about fifty feet north of raise No. 223 west is another raise which is not accessible, which is left colored gray, so it may be that a portion of that or all of it, as far as I know, is in the vein. Still further north we have the two raises, the highest of which is marked raise No. 2 west. This is located exactly upon the south side line of the Senator Stewart Fraction claim, and extends upward from the tunnel level for a distance of 147 feet. It is closely timbered, and the vein cannot be seen in this raise until near the top. That portion I know is in the vein and that is colored red. At the top of this

(Testimony of Walter H. Wiley.)

raise, cutting squarely across, there is a streak of clay gouge. This gouge appears at about—this gouge dips at about 30 degrees in a northwesterly direction. There is no working above this or to the side to enable [831—786] one to determine whether the vein continues above or not, but it is certainly interrupted by this fault, and it has been called the Clancy fault. There is one other working, raise No. 7, which starts up back in the footwall country and continues up for about the height of 100 feet, where there is galena ore shown in the top of that raise. The stopes which I presume originally extended from this raise are now entirely inaccessible.

There has recently been run a branch from this raise shown by the working marked No. 7 raise, and in the upper portion of this raise a fault has been developed, having an appearance and direction such that I believe it is the same fault as developed in the top of raise No. 2 west and called the Clancy fault. At this point the same or a similar condition of affairs existed as far as determined above this fault. It breaks through into old workings, and the crosscut is shown upon this model, which is taken from the plaintiff's map, and I have seen nothing of that crosscut except that there are caved timbers. I cannot determine from this showing alone whether it is a crosscut or a stope, but the crosscut is put on the model from plaintiff's map. [832—787]

In order to find what there is in the mine above this Clancy fault, we have to ascend to a higher level, the upper Stewart level which is an old work-

(Testimony of Walter H. Wiley.)

ing tunnel which from the surface has a crosscut curving around through the quartzite country. Out near its southern end a drift has been run out a distance of some three hundred feet, which follows a vein. There is some stoping from this level shown by the small workings, which are perfectly inaccessible to-day. There are several small chutes, three at different points, extending up from the crosscut in a vertical way, which are not at all accessible but which indicate to the miners that there is some working of some sort above this drift or crosscut back in the foot of the vein. The only point higher up is a small working called the vent on the surface of the ground, where there can be seen a square box projecting out from an upraise at the surface of the ground. This is inaccessible, but it indicates that that was some working from somewhere below which reached the surface of the ground and the box was placed in it to keep an air current going through.

The vein which is shown in this upper Stewart tunnel level is a similar vein to that which is shown in the lower [833—788] Stewart tunnel level; it is a fissure vein, the same as below, a fissure vein which has been very materially enlarged by replacement after the formation of the fissure. We see at the southern end a couple of faults, one coinciding in direction largely with the vein, another running nearly across the direction and dipping to the southwest. The fault which is shown at the southern end and dips in a southwesterly direction does interrupt the continuity of that vein, but not in a direction as it

(Testimony of Walter H. Wiley.)

descends toward the lower Stewart tunnel. You can go downward from this upward Stewart tunnel through a shaft known as the Samuels raise, through a crossscut at the bottom, and reach the lower Stewart tunnel level. These workings, like so many in the mine, are largely caved, and while you can go out for a short distance into several drifts which have been run, I have not been able to get into those drifts sufficiently to know what they disclose. From my own knowledge I only know that in this upper Stewart tunnel level we have a vein dipping at an angle of thirty to forty degrees, and which I have seen extending downward in the bottom of this level; in the lower Stewart tunnel we have a vein similar, which extends upward at a slightly steeper dip from the tunnel up at about forty-five degrees and [834—789] this vein continuing up was interrupted by the Clancy fault. The amount of the throw from the Clancy fault cannot be determined from any workings which I have been able to see; I can only by inference say that, having a vein extending downward at an angle of forty degrees from the upper Stewart tunnel, if that vein is not interrupted by any fault other than the Clancy fault, it will meet the plane of the Clancy fault at a distance somewhat in the footwall of the vein which extends upward from the Stewart lower tunnel level. The dip of this vein which continues down through the workings, through the Gray ore body, is shown approximately as I hold my pointer. There is no material change in the course downward of the vein to actu-

(Testimony of Walter H. Wiley.)

ally connect those upon one continuous vein from the apex in the vent to the Gray ore body below or to the Frank ore body. In order to make this condition somewhat clearer I have made a cross-section through that section, but not exactly at right angles to the vein, but taking the highest point, the face at the surface at the lowest point in the Gray ore body. This is section No. 5.

Section No. 5 marked for identification Defendants' Exhibit "J." [835—790]

The WITNESS.—It is a section of the earth, supposing it to be cut down vertically as indicated by my pointer, and is shown by the model immediately beneath where the section is made. This is the same scale as the model, and shows at the surface the vein. Below that, extending upward from the tunnel a small raise, which is now inaccessible; it was put on there from information furnished by Mr. A. M. Porter. The upper Stewart tunnel is shown at the elevation of 3,100 feet, corresponding to the point on the model; below that the vein is projected down as shown by the dotted line on a dip of forty degrees, this being the steepest dip which I have observed in the upper Stewart tunnel. In the lower Stewart tunnel, down probably at an elevation of 2,900, it shows the vein extending up at a dip of about forty-five degrees until it meets the Clancy fault. If the vein from the upper Stewart tunnel continues down, as I believe it does, possibly with minor interruptions from subsidiary faults such as we find at numerous points in the working below—it will meet the Clancy

(Testimony of Walter H. Wiley.)

fault at a point as shown upon section 5, about sixty feet in the footwall of the vein as developed in the raises extended upward from the lower Stewart [836—791] tunnel level. Below this point the raise continues, and the vein continues below the lower Stewart tunnel and is shown in dotted lines, because I do not know its exact course, but I have no doubt whatever that it does continue substantially as shown through the intermediate level, through the stopes and down to the 200 foot level and for a distance below that. Here it meets a serious interruption, the No. 11 fault, which dislocates the Frank ore body and separates it from the Gray ore body is cut by this line of the section, and the ore body as shown by the Gray stope lies to the right or to the east at a distance of about 180 feet from that portion of the vein going downward from the working above; in other words, the dislocation of the No. 11 fault is to my mind at least three times as great in *his* section as is the probable dislocation of the vein upon the Clancy fault.

Now, the most pronounced feature as we go to the north upon these various drifts is the fault which has been called the Osborne fault. I don't know whether it is the Osborne fault or not, but I do know that it is a big fault. There has been a large amount of throw upon that fault, and I will speak of it as the Osborne, although I [837—792] do not, by doing so, vouch for its being what has been called by the United States Geological Survey the Osborne fault. On the lower Fir tunnel, which is some 860

(Testimony of Walter H. Wiley.)

feet in length from its mouth out to the northeast, from the portion shown upon the model, we go through the black slates and come to the white quartzite which constitutes the country rock throughout the section of the Stewart and Ontario mines, and at that place we come into the Stewart vein. This vein has been followed for a distance south of the quartz by the workings on the 400 or Fir tunnel level, but after about 200 feet to the south of the northern end the workings go back—a series of workings go back into the footwall as shown by the gray coloring, and in order to reach the southern extension of the vein we go through crosscuts to the east. We can go upward on the vein to raise No. 410, which is not accessible at present, however, but through other raises and through the stopes, and we can go from the stopes in the portion of the mine colored red to the east, through a series of flat stopes, and get back upon the 300 foot level in drift No. 305 east, following continuous stopes all the way; so that the drift on the 300, No. 305 east, is upon the same vein as the drift on the 400, 409 and 415. [838—793]

Going northerly on the 300 foot level, or northeasterly, we again go into the Osborne fault where it has been developed both by a drift on its strike and by a raise, 314 east, going upward. We can also go south on the 300 foot level, I think continuously on the vein; I say I think simply because there are portions which are timbered where I cannot see it, but upon the vein, I will say, continuously to the Gray stopes. We come into the side of the Gray stope,

(Testimony of Walter H. Wiley.)

which extends now upward above this level to a height of 33 feet, following on a slightly rising course, simply the grade of the level, a few feet in an upward direction, until we meet an ore body dipping downward at right angles to the drift, and as I say, extending upward to a height of 33 feet above this level. If we go through the footwall portion of those workings we go through country rock in order to reach the Frank stopes, through country rock showing a separation of more than 150 feet on the 300 foot level between the Frank and the Gray stopes.

Going upward upon the Osborne fault from this level we rise at a pitch of 49 degrees for a distance of 85 feet through raise 314 east. At the bottom of this there is excellent galena ore, and it extends upward to a height of about 25 feet above the level. Above that the raise is [839—794] entirely barren; it is a white clay, clearly different in every way from the Stewart vein. The clay is in places dark colored, has a narrow streak, but generally speaking it is very light in color. At a height of 85 feet in this raise above that, the raise is much more nearly vertical, a dip of about 80 degrees; this is due to a splitting of the fault, and the raise followed the steepest part. I was up that raise on a day when I could see the top, when they made the turn, and the footwall streak was followed at a dip of 49 degrees, and continued up that raise, and the raise followed on the steeper portion of the *hanging*. This indicates a division of that fault to the north,

(Testimony of Walter H. Wiley.)

as we rise, and simply shows that above this point the northern or footwall side of that fault has not been developed. If it continued in its direction, the fault in the upper workings will be quite a number of feet north of the fault as developed, and the plane of the fault which does cut off the vein—it is cut off by the southern face; in other words, of the fault, and if this continued as two faults above there, there will be a section between the two, in which we do not know what exists; there may be more vein material in that section before the final and complete severance of the vein by the [840—795] Osborne fault. This fault has further been developed at about the point of the cut-off of the vein in raise No. 218 east, which continues from the 200 foot level up through the hundred to the upper Stewart tunnel. The 100 level is not accessible at this point; the raise goes through it, but you cannot get at all into the level, but in the upper Stewart tunnel level.

Q. You mean the lower Stewart level, don't you?

A. Drift No. 105. Drift No. 100 is not accessible, The lower Stewart tunnel level can be reached through this raise, and is accessible, except that near the northern end there is a tight bulkhead, so that you cannot see what is the condition in the face of the drift. This lower Stewart tunnel at about 60 feet from raise 218 east *shown* an excellent vein with much galena through it. This is the highest point at which this vein can be seen, with one exception, that through a raise in the Deering crosscut you can reach a point approximately 25 feet higher in eleva-

(Testimony of Walter H. Wiley.)

tion, where there is a section of what I believe to be the same vein shown. Doubtless this was all connected through stopes at one time. This little work, therefore, above the Stewart tunnel level, which is reached by the raise from [841—796] the Deering crosscut, is the line upon which the vein which has been followed from below can be seen.

There is above this something in the way of a fault, another fault, different from the Clancy, and perhaps different from the No. 11. This fault can be seen in the crosscut below, and also in another crosscut about 40 feet to the south, simply as a plain gouge cutting through, so that from this disclosure there is evidence of a fault dipping somewhat in the nature of the Clancy fault, and interrupting the portion of the vein, which continued downward to the Gray stopes from that portion lying to the north, and which can be followed downward to the Frank stopes; in other words, there is an interruption, and a certain state which is exhibited in this model, as shown by the blue color, varying from 160 feet in the southern end to a narrow space in the center of the model, and widening again in the section between drift 4 east on the lower Stewart tunnel level and the drifts to the south.

There is one point, I should say, of this area in drift No. 100 and the workings thereabouts, which are painted gray upon this model, where it has been said these portions come together and one can go on ore from that portion which is [842—797] followed up from the Gray stope to the other portion

(Testimony of Walter H. Wiley.)

which goes downward to the Frank stope. That section is entirely caved, and I don't know what is in there. If I had been through there and had seen ore, there would be some red color on the model through there, through the drifts or stopes which could be shown at that section.

Q. Before proceeding, Mr. Wiley, with that part of the model, I will call your attention first to the portion on the west end of the Senator Stewart Fraction, running at an angle with the north line of the claim, and ask you what that is.

A. To the north, disclosed in the old lower Stewart tunnel at the point about 400 feet in from the mouth of the tunnel, there is a drift running in a southwesterly direction and another in a northeasterly direction. These are colored blue upon here, as following a fault, and there is also a little red material, showing that that is a mineralized fault. A little above this and to the south is this large stope working colored red. There is a very considerable body of ore in there, lying rather flat, disconnected from any of the other workings, and as far as I know having no relation, although it may have been a faulted section of this vein. I [843—798] don't know as to that.

Now, we have one thing which is apparent both upon the maps and upon the model as regards the strike of this vein. While it has many variations, it is comparatively regular if you take an average strike; it is comparatively regular, while there are many local variations, if you take average dips. The

(Testimony of Walter H. Wiley.)

strike of this vein, taking its direction as shown by the various workings in the upper Stewart tunnel is north 31 degrees east for a distance of 290 feet. The strike in the lower Stewart level is north 33 degrees east for a distance of 900 feet. The strike in the 200 level is north 42 degrees east for a distance of 600 feet. The strike in the 300 level is north 34 degrees east for a length of 800 feet. The strike in the 400 foot level is north 21 degrees east for a distance of 300 feet. The strike in the Gray drift is north 30 degrees east for a distance of 330 feet. The strike in the Frank drift, the drift under the Frank stopes and continuing northerly is north 38 degrees east for a distance of 230 feet. Those courses show that there is a considerable uniformity in the strike of this vein, when you treat it broadly throughout the whole, but as we approach the Osborne fault on all of these levels there is a perceptible [844—799] bending. Whether this bending is caused by the fault, or was there before, I do not know, but there is an unusual condition, an abnormal condition as regards the strike of the vein at that point. This is simply a local condition, and extends for a comparatively short distance south of the plane of the interception of the vein by that fault. The nature of the interception of the vein by the fault, I think, can be seen by the intersection of the blue plane better than it can be described. In the Siligo tunnel, or Apex tunnel, which I have not yet mentioned, we have raise No. 4 east connecting the lower Stewart tunnel with the Siligo tunnel upon the Stew-

(Testimony of Walter H. Wiley.)

art vein. There is a fault shown, following substantially the course of that vein in the Siligo tunnel. At its southerly end, there is another fault, dipping at about 30 degrees, similar to that of the Clancy fault, and it probably is the Clancy fault. In addition, at the easterly end of this, the Osborn fault cuts across, so that we have the condition in that level of the meeting of the zone between the Osborne fault and the Clancy fault, and I think a third fault, corresponding in direction with the wall of the vein, so that the country is very much crushed and broken. But extending from this point, which is [845—800] near the surface of the ground, downward to the Fir tunnel, we have, as shown by the dipping blue sheet the undersurface of the Osborne fault. The plane of the Stewart vein is as shown by a plane if it were laid over the red workings. In every case, the blue sheet, the Osborne fault, is reached by the drifts running out upon the Stewart vein. If the country down to the Clancy fault were eroded, we would have a substantially level line as represented by this pointer from the Siligo tunnel to the south. If the country under the Osborne fault were eroded—we cannot say above the Osborne fault, as we did in the case of the Clancy fault, because that would necessarily mean the removal of the entire vein—but if the country to the northeast, which is under the Osborne fault, were eroded, we would have the appearance shown by that blue sheet. If we followed the apex of the vein beneath the Clancy fault we would walk northeasterly on a comparatively level line. When we reached

(Testimony of Walter H. Wiley.)

the Siligo tunnel we would step off into space. The only practical way of working the mine—which has been called the apex from there down—by the miner, would be by getting at its apex above and sinking a shaft, and then driving a drift out until he reached the Osborne fault, and then he would have a splendid place for a dump. [846—801]

There is one thing I would like to speak of as regards the thickness of this vein and its intersection with the fault. The stopes are in many places quite wide, eight and ten setts, five feet to the sett. This does not by any means mean that the vein, if it is ten setts wide, is of a width of fifty feet, because it is a flat vein, it is variable in its dip, and sometimes the vein lies locally quite flat, so that you can have a vein only a few feet in width, and yet developed indefinitely on a horizontal plane by the stopes. The solid ore, the galena, does not by any means represent the full width of the vein in my opinion. It is often scattered through the quartzite adjacent to this ore, but in no place have I seen anything approximating a width of 80 feet or 50 feet at right angles to the plane of the vein. The width of the vein as it approaches the fault makes a tremendous difference in determining the highest point of the vein; if it is a comparatively narrow vein, the top of that will be very much lower than the top, if it is twice as wide, because it is approaching the plane which cuts steeply across the plane of the vein. To illustrate that point as to the width of the vein and the dip of the vein, I would like to take that photograph of Mr. Frank's

(Testimony of Walter H. Wiley.)

in the lower Stewart tunnel, Plaintiff's [847—802] Exhibit 16. This shows splendidly the fault on the right and the vein on the left. The line of contact between the two is, of course, the dip of the fault, not the dip of the vein, and it was not presented as showing the dip of the vein. The dip of the vein, however, was, as I remember it, said to be illustrated by the dark line extending through the photograph. Now, this is necessarily a view looking toward and into the vein as cut off by the fault, because it was taken in the drift itself, as described. Now, at a point just 17 feet west of the point at which this photograph was taken, there has been a crosscut eight feet long run across this identical body of ore, so that you can get a view just like a cross-section, instead of looking at the end of the ore, you get a view of the side of this same ore as it dips down into the earth. The conditions at that point, just 17 feet away, are as shown—

Mr. FOLSOM.—I would like to have this paper marked for identification.

Little cross-section produced by Mr. Wiley marked Defendants' Exhibit "K" for Identification.

Q. Just point that out on the map. [848—803]

A. It is a point on the lower Stewart tunnel near a point marked "L 5362." I will give its location more exactly, by referring to the point which is marked on the defendants' map. It is taken at a point 12 feet west of station 2512. That station is not on our map, but is on Plaintiff's Exhibit No. 1.

Q. Who made that cross-section?

(Testimony of Walter H. Wiley.)

A. That is a sketch which I made myself on the ground, and—it is a rough sketch, but it shows on a scale of one inch equals one foot the side of this cross-cut, the same body of ore as shown in the photograph, except that instead of the view of the end of the ore corresponding to the portion on the left of this sketch, it is an exact cross-section of the side of the ore, just as if the crosscut had been run in where this photograph was taken and a view taken from the side. It shows this very distinct body of ore; it is very black and has much galena in it, and is clearly and sharply distinguished from the brown and white country quartzite above and below. The galena is from three to four feet in thickness, and is shown downward upon its dip for a length of 8 feet. The greatest dip at any point is 19 degrees on the under side, the average dip as it approaches the [849—804] fault is 10 degrees. Is that place now accessible?

A. It is, yes, or it was accessible yesterday.

Q. Does it still show the same condition as disclosed in the photograph and this sketch?

A. It shows the same condition as disclosed in the sketch. The condition disclosed in the photograph is not the same in the ground now, as there has been considerable digging at this point.

Q. Mr. Wiley, is the edge of the vein, the terminal edge of the vein against the Osborne fault in your opinion the apex of the Ontario ore body?

A. It is the edge, not only the edge, but the under edge, the downward termination, as well as the termination upon the strike of the Stewart vein. The

(Testimony of Walter H. Wiley.)

apex of the Stewart vein lies to the south and above the Osborn fault.

Q. What is the course of the edge of the vein as distinguished from the course of the Osborne fault, the edge of the vein against the Osborne fault?

A. The course of the Osborne fault on the level is approximately north 85 degrees west, that being shown by the blue plane. The course of the edge of the vein, the terminal edge against the fault, corresponding to the red line [850—805] marked apex upon Plaintiff's Exhibit No. 3, I believe, is north 41 degrees west.

Q. What is the course of the lower Stewart tunnel or of the terminal end of the vein against the Clancy fault above the lower Stewart tunnel?

A. The course of the lower Stewart tunnel is north 30 east, and the course of the terminal edge under the Clancy fault is about the same.

Q. Is there any bend in the vein in the Siligo tunnel or on that level?

A. There is something of a bend in the vein, but as I said, that is in the area lying between the Clancy fault and the Osborne fault, and it has been very much broken and disturbed throughout that section.

Mr. FOLSOM.—You may examine.

Whereupon further hearing was adjourned until 1:30 P. M. of this day, Monday, January 13th, 1913.
[851—806]

(Testimony of Walter H. Wiley.)

January 13, 1913, 1:30 P. M.

WALTER H. WILEY resumed the stand for further

Direct Examination.

(By Mr. FOLSOM.)

Q. Mr. Wiley, was that model prepared under your direction?

A. It was made at my suggestion.

Q. You know it to be correct as explained?

A. It is a correct representation of the workings shown on the plan map.

Mr. FOLSOM.—I offer the model in evidence.

The COURT.—It will be admitted.

Mr. DINES.—We wish to make an objection, that Mr. Wiley has already stated that a part of the information from which it was made came from other sources and from other information, and I would like to ask him some questions about the model before it is admitted.

The COURT.—I will withdraw my ruling, and you may ask him some questions about it if you desire.

Cross-examination.

(By Mr. DINES.) [852—807]

Q. Mr. Wiley, in the course of your examination, with reference to the model which has been marked for identification Defendants' Exhibit "L," offered in evidence, concerning which you have testified, you stated that if a miner would come out to these portions of the Stewart vein that are on the Osborne fault, and assuming that all of the mass of the mountain beneath the fault were moved away, he

(Testimony of Walter H. Wiley.)

would have a good place to dump, did I understand you correctly? A. You did.

Q. That is correct, is it? A. I think it is.

Q. I think you have examined the Sierra Nevada claim, haven't you? A. Casually, some time ago.

Q. It overlaps the Ontario a certain portion of it, its lines, doesn't it?

A. I haven't clearly in mind the location of the lines, but it is in that vicinity.

Q. It is in this vicinity? A. Yes.

Q. In the case of the Sierra Nevada they have an [853—808] outcrop of the vein there on the east side of the gulch, have they not?

Mr. GRAY.—I think I will object to that. I don't believe that they ought to go into these other claims and take up all of these phenomena in the Wardner district.

The COURT.—I shall overrule the objection. It is a claim continuous, I understand.

Mr. FOLSOM.—It does not overlap, as a matter of fact, but it is near there.

The COURT.—In view of the evidence I shall allow a pretty wide range of cross-examination.

Mr. DINES.—I didn't desire to interrupt the witness when he was making those statements because I did not want to interrupt the course of his discourse.

The COURT.—He may answer.

A. They have an outcrop for a distance on the hillside, yes.

Q. And the miners in the ordinary course of

(Testimony of Walter H. Wiley.)

operating the mine, running their cars right along the gulch, have a good dumping place, haven't they?

A. Yes.

Q. Right down in the gulch? [854—809]

A. Yes.

Q. You don't think that interfered with the fact that the Sierra Nevada had an apex, do you?

A. I don't know as to that.

Q. You don't think the fact that, if the hypothetical supposition that this cut-off took place, that if some one went to the trouble to take all the mass of mountain off from under the Osborne fault, so that the conditions that you represented in that portion of your answer should be true, that that would detract from our having an apex in the Senator Stewart Fraction if we otherwise had one, do you?

A. That was merely an illustration to explain the actual conditions as they exist now.

Q. It did not enter into your opinion on that?

A. Yes, it necessarily had some effect in forming my opinion.

Q. You offered that suggestion in connection with your testimony in the nature of a rather cordial New Year's greeting to us, than as a matter upon which you base your opinion as a scientific man, did you not?

A. No, I stated first, that if the country above the Clancy fault were eroded you would have certain conditions, [855—810] and then carry the analysis further and supposed that the country under the Osborne fault were eroded, and you would have

(Testimony of Walter H. Wiley.)

entirely a different condition. In one case you would have the top of the vein outcropping on a straight line; in the other you would have the undercut bottom edge of the vein coming out in an overhanging cliff.

Q. So that far that matter of having a good place to dump did enter into and form a part of your opinion as an expert witness and a witness in this case, isn't that correct?

A. I merely used that illustration in order to make it plain, the same as I said that a person going along the level would step into space. If it is an overhanging fault, as it is.

Q. I understand that part of it, but I want to know if it entered into and formed a part of your scientific opinion.

A. I think it is a homely way of expressing the fact that it would be coming out under an overhanging cliff.

Q. Now, you have represented on this model the stopes of the Ontario; you have not presented the stopes of the Stewart Fraction, have you? [856—811]

A. That is true. I stated the reason, that we had the data complete in the case of the Ontario stopes, and that the Stewart stopes were largely inaccessible, and the data for constructing them is lacking.

Q. But you had access to these workings or you have surveys upon which Exhibit "C" was made, did you not?

A. Yes, and those workings are all shown upon

(Testimony of Walter H. Wiley.)

this model. Of course the plaintiff could have built a model including their stopes, and made it complete. We could not.

Q. You could have taken them from our stope map, could you not?

A. Not from the stope maps that you have presented.

Q. Then the reason for the omission of the stope of the Senator Stewart Fraction from the model known as Defendants' "L" is—by reason of their omission is true that this model would present to a person first looking at it some evidence of the dip and strike of your Ontario ore bodies and little evidence of the dip and strike of our Senator Stewart Fraction ore bodies, is that not true?

A. That is not true. May I explain the reason?

Q. In one moment; I have another question first. [857—812] Is it not true that the stopes of the Senator Stewart Fraction, if filled in here between the levels as shown on this model and between the different upraises as they actually exist in the ground, would give a clearer idea of the dip and strike of the Senator Stewart Fraction vein than as presented upon the model, without reference to the reasons?

A. That is partly true and partly not true. I can explain in a few words why I qualify that.

Q. All right, go ahead.

A. The model would be much more complete and much more satisfactory, very much more so, and I wish very much that the stopes could have been put

(Testimony of Walter H. Wiley.)

in. It would have shown the continuation between these red levels on the line of the dip, where now there is a void. As to the strike I think it would rather have obscured the question of the strike, because in this case we have the levels standing out by themselves much plainer than if they were obscured by the stopes. That is the same on Plaintiff's Exhibit 2, which shows the stopes; the red covering is made as a separate map in order not to obscure the direction of the drifts upon Plaintiff's Exhibit 1. [858—813]

Q. Now, you say that this model has been reduced to scale?

A. It is made on the scale of fifty feet to the inch, the same as the plan map.

Q. Were all the parts of it that have been referred to by you scaled?

A. They are all made on the same scale as the map, yes, sir.

Q. Were they scaled with reference to the part that represent or purports to represent, so that they give you in connection with the model, the same relative size or length of dimensions as you would have if you would see the ground itself?

A. Yes, with this qualification: for instance, there is one, the Osborne fault is shown simply by this sheet of celluloid which has a very material thickness, and this simply shows the upper claim against which the vein turns.

Q. Well, I will call your attention to this portion here you have called vent. Is that reduced to scale?

(Testimony of Walter H. Wiley.)

A. I said that the vent was simply a box sticking out from a shaft or raise which has been made from below and which is inaccessible. We have simply placed a small [859—814] piece of copper fastened by this wire to indicate that place. Whether it is exactly the size of the box that was put there or not, to scale, I am not sure; I am inclined to think it is a little smaller than the actual box through which the air goes.

Q. That box that you referred to was seen by you personally? A. Yes.

Q. What is the size of it as it is on the ground?

A. I saw it last fall; I think it is about a foot square as it sticks out, and it sticks up quite a number of feet.

Q. Down below did you see any workings that it connected with?

A. I saw three chutes down below; whether it connects with them or not I don't know of my own knowledge.

Q. Where did you see them?

A. In the upper Stewart tunnel.

Q. How far is the point of your observation in the upper Stewart tunnel from the vent; what distance?

A. The distance on the slope of the vein scales about 190 feet. [860—815]

Q. Now, how far did you see these workings that you refer to above the upper Stewart tunnel?

A. They were on the tunnel and for a few feet above, two or three feet. They are caved above that.

Q. Then you don't mean to be understood as say-

(Testimony of Walter H. Wiley.)

ing to his Honor positively that those openings now are continuously connected with this vent?

A. From my own knowledge I certainly do not wish to be understood as saying that they connect.

Q. Was that vent, the part of it that you looked at vertical in the ground or on an incline?

A. As I remember it it was on some incline.

Q. You were also asked about the strike and dip of the ore bodies represented on this model, and I understood you to give a number of instances where you had taken the strike for certain distances, and you took an average. Is it your statement to the Court that that average represents the course of this vein, the direction of the course of this vein throughout its entire extent?

A. It represents the average course of the vein throughout its entire extent and for the distances given specifically on each level. [861—816]

Q. You take the Mississippi river, which is over three thousand miles in length, as it goes from Itaska Lake down to the gulf. Between Minneapolis and St. Paul it is a matter of common information and knowledge that there is a ten mile course of that river east and west, and above that as it comes down from Lake Itaska there is much more than ten miles, more than fifty miles east and west. You would not think that a general course that you would obtain by way of an average, would give you an exact description of that portion of the river between Minneapolis and St. Paul where it is east and west, do you?

A. Certainly not; it would not give the direction

(Testimony of Walter H. Wiley.)

where that unusual direction in the river occurred.

Q. Now, in this case, the Stewart vein, you say, is a fissure vein, but the deposition of ores has been largely by replacement. Do I quote you correctly?

A. Yes, the original fissure has been much enlarged by a replacement of the adjoining rock.

Q. Now, where ores are deposited by replacement in a replacement vein, you find greater irregularities of dip and on strike, than you have in the ordinary and true fissure vein, do you not? [862—817]

A. You are likely to have, yes.

Q. And there is a good cause for that, is there not; is it not because the solutions as they eat out and take into solution the rock with which they come in contact, are necessarily or to some extent limited and controlled both by the solubility of the material which they attack and by its imperviousness to the liquid, is that right?

A. That is *the* right, with the added explanation that in this case, where the rocks are quartzite and not limestone, and more homogeneous in their nature than the average limestone, that I think the changes in the vein are due more to differences in the original fissuring than to a difference in the solubility of the enclosing walls.

Q. In any event, you find these extreme irregularities both as to dip and strike, of this vein when you compare different portions of it, do you not?

A. When you compare different local portions, yes.

Q. I will ask you, if you please, on Plaintiff's Ex-

(Testimony of Walter H. Wiley.)

hibit No. 1, Mr. Wiley, drawing a line from the point on Exhibit 1 where the vein crosses the southerly side line of the Senator Stewart Fraction and the point on the same exhibit where it crosses the easterly end line, give me [863—818] the course of that line, if you will kindly do that.

A. The point where the vein crosses the southerly side line at what elevation?

Q. At the highest elevation that it is known to cross there in the workings that we have.

A. You mean to take the point at the top of raise No. 2 west under the Clancy fault? That, in my opinion, is not the highest elevation. I would take a point up there—

Q. Well, I will assume the point so that I will relieve you of the responsibility of selecting that point. From the point “W” to the point where the vein crosses the easterly end line of the Stewart Fraction, please give me the course of that line.

A. From the point where the vein crosses the easterly end line of the Senator Stewart Fraction on the 300 or 400 foot level, or where?

Q. On the 300 foot level.

A. That is, from the point on the end line where the footwall side of the 300 foot level intersects the east end line to the point “W” at the head of the Clancy raise is nearly east and west, about north 85 west, as [864—819] you can see by the blue lines which indicate east and west. Have you known of that method being taken to determine, not scientifically, but generally, the course of a vein in litigation

(Testimony of Walter H. Wiley.)

over vein rights? A. No, I never heard of that.

Q. Have you read the Horseshoe case decided by the Supreme Court of the United States?

A. I don't know. I have heard something about it.

Q. Do you know about the Horseshoe case?

A. I have heard of it. That was in Leadville, wasn't it?

Q. Yes. A. I have heard of it.

Q. Have you read the Delmonte case, decided by the Supreme Court of the United States?

A. I think I have, but some time ago.

Q. Do you not know that in that case the Court passed that kind of a line in determining the general course of irregular veins?

A. No, I am afraid you are doing the Court an injustice, I don't know—

Q. Well, I would like to show it to you. [865—820]

A. Well, I would like to explain, that in taking my courses I take points on practically the same elevation.

Q. You do admit that even the general course as found by your average, or the average course determined by your average, would depart to a considerable extent from the course of portions of the vein that could be selected? A. That is true.

Q. What is the course on your exhibit, or on your plan map if it is more convenient for you, on the 300 foot level in the Senator Stewart Fraction?

A. I have previously taken these courses from the

(Testimony of Walter H. Wiley.)

map, and I find in the 300 foot level a course of north 34 east for a distance of eight hundred feet.

Q. That is as the level runs in the ground?

A. The 300 level is colored in brown.

Q. That is the one you just gave? A. Yes.

Q. That is taken from what point; where do you get your eight hundred feet?

A. Taken for a distance of eight hundred feet from the southerly end of the vein to the northerly end of the vein. [866—821]

Q. In that you took into consideration the ore bodies that are called the Gray and the May in the Ontario, that portion of the level that is shown there, did you, in its winding course?

A. This portion of the level marked drift 313 west, that is the portion. We know that is a crosscut; also there is a crosscut on the northern end of drift 313 west, but that was not taken into consideration.

Q. Then you began at that point where you hold your pointer, at the end of the crosscut on the 300?

A. The vein is straighter than the working, that is all; the vein goes through from the end of this 313 west drift, and goes through straighter than the working, which runs nearly square across as a crosscut.

Q. Now, if we compare that course with the course that is shown on the 200 foot level, we will see that the portion of the 200 foot level between raise 211 I think it is, and the point where the ore is last shown in that level, you would find that an entirely different course, would you not? A. You would.

(Testimony of Walter H. Wiley.)

Q. What would be the course of the vein in the section [867—822] that I have designated?

A. That would be very much easterly and westerly.

Q. I would like to have that as near as you can give it, if you please, Mr. Wiley.

A. That would be about seventy-nine east as scaled on the map.

Q. Now, I will ask you to take it from the foot of raise 218 east to the breast and give me that course.

A. That is a course I should explain, that you are not taking the course of the vein; you are taking the course of the fault. Do you wish that?

Q. Yes. A. Well, about south 85 east.

Q. Is the vein up against the fault there all the way? A. No.

Q. How much of it is exposed?

A. The vein is shown at the end of raise 218 east; that is the termination in an easterly direction, but the balance of the drift follows simply the fault.

Q. Is this working here on Exhibit 1, where there is an indication of white on the 200 level, that seems to [868—823] make a loop; is that on the vein?

A. I presume so; I have never been in that portion of that drift; that is caved.

Q. You think it is in the vein, do you?

A. I presume it is.

Q. Isn't it true, that, following that portion of the vein that comes from the foot of raise 218 you would have a vein away from the fault, running with a course almost due east and west?

A. Well, that would not be the course of the vein

(Testimony of Walter H. Wiley.)

properly; if this is a wide vein between the two, the course would be as shown by the longer drift.

Q. The upper one is the longer drift?

A. I have never seen what is in there, and I don't know. I surmise that it is probably the fault.

Q. What do you find as to the course of the vein immediately under the old lower Stewart tunnel level and near raise 218 east, the portion of it away from the fault?

A. I have never seen that drift on the 100 foot level, that is inaccessible. On the tunnel level itself I see the vein very clearly.

Q. On the tunnel level itself, what is your course of [869—824] the vein there from the shaft extending on in an easterly direction as far as you can trace the vein?

A. North sixty-five east is the course of that portion.

Q. Very different from the course that your average indicated, isn't it?

A. Entirely different from the course of the vein, if you consider it in its entirety, extending down to a point covering the ore bodies in the Ontario claim.

Q. Will you give me the distance, if you please, of the last course that you named on the tunnel level and on the 200 foot level, between the points that are already identified in the former questions?

A. On the 200 foot level the distance scales 290 feet; on the tunnel level the distance scales 300 feet—no, excuse me; I am away off. I have got the wrong scale. I am used to working on our map, which is

(Testimony of Walter H. Wiley.)

a fifty scale, and that is on another scale.

Q. Yes, this is thirty feet to the inch.

A. Well, let me change those answers if you please. On the 200 foot level the distance as scaled on the plaintiff's map, which is on a scale of thirty feet to the inch, [870—825] is 170 feet. On the tunnel level the distance over which the strike was taken is 180 feet.

Q. Mr. Wiley, your model was based on what information as to the vein in those portions that you did not visit yourself?

A. It is based very largely upon the testimony of the plaintiff in this case.

Q. Well, how do you select that testimony, from reading it over out of the stenographer's notes?

A. No.

Q. From notes of your own? A. Yes.

Q. Well, who stated it to you?

A. As we heard it here. I do not mean to say that the plaintiff stated what was in each particular working, but where he showed on his stope map, for instance, a continuous stope, I assume that there is a vein through those stopes.

Q. And on what information did you leave that vein out in portions where our witnesses testify that it is, and where we say that it is and claim that it is?

A. In no case intentionally. We may have overlooked [871—826] some of the testimony. I have mentioned, for instance, one raise here that is gray, red only part way, and the strong probability

(Testimony of Walter H. Wiley.)

is that that particular working is in the vein, but I don't know.

Q. So you colored that red, did you, in that instance?

A. I colored that red for a part of it, red around the top.

Q. Which raise do you refer to? A. This one.

Q. By leaving the balance of that red off, you do not mean to say to the Court that there is no vein in that portion of it?

A. In that particular case, I have never seen it—I don't know, but I have an opinion, based upon the fact that I have seen the vein near there at a higher elevation.

Q. Then, if you had seen it at a higher elevation, why did you not color that red in there if you pretend to make a fair model?

A. I have colored this adjacent raise red on the top where I actually saw ore.

Q. But one looking at this model would say that the [872—827] went out of the vein at the point where the red ended?

A. One looking at that model and noticing the red color above and the red color below would draw the inference that the vein extended, in connection with the testimony which I now give, that they extended from one to the other.

Q. In the first case why didn't you paint it red?

A. I think this raise is probably under it in the footwall.

Q. His Honor has not had the opportunity to ex-

(Testimony of Walter H. Wiley.)

amine it that you have, and when you are trying to show him the conditions there, you say that he would naturally draw the inference on that raise—why didn't you aid him by putting it red like you did these other portions?

A. I endeavored to aid him in my testimony, describing that particular raise, and saying that I did not know, and I further endeavored to aid him by this cross-section No. 5, which shows the vein continuing down through that section.

Q. Then you do not claim that the portions of this model, Exhibit 14, that are not shown in red in all instances, do not disclose *vine*, do you? [873—828]

A. I see no other place to which that applies except raise No. 2 west, which I have described as going up 147 feet, and showing vein in the top, but in order to reach that I went through a very tightly timbered place, which is painted gray, to the point near the point where it becomes steeper; from there up it is painted red, and I do not mean to say that that is exactly the right amount of red, because I don't know.

Q. You don't mean to say that that raise No. 2 west on the model below the card indicating it not being done in red, that that did not have a vein in there, do you?

A. I mean to say this, that it was so tightly timbered that I could not determine over there.

Q. Answer my question now, please.

(Question read.)

A. I mean to say that it does have a vein in it as

(Testimony of Walter H. Wiley.)

described and as painted for a portion of the distance.

Q. That does not answer my question. I will ask another question.

The COURT.—You do not let him answer that one.

Mr. DINES.—Q. If you will answer my question, then you can explain afterwards. Do you mean the Court to [874—829] understand you, by presenting this model with the lower portion of raise No. 2 west colored in gray from the point it rises above the level, that that portion of the raise immediately adjacent to the level in its upward course does not disclose a vein?

The COURT.—You can answer that question.

A. I can for a portion of the distance. As to this particular raise I can say that it was left that way because I heard Mr. Clancy in his testimony say that it did not reach the vein until this upper part, so it is colored there to agree with the testimony of Mr. Clancy.

Q. You heard Mr. Clancy say that yourself, did you?

A. I did. If he did not say that, then I misunderstood him.

Q. Now, you know that there is stoping all above this drift No. 4 west and drift No. 4 east, do you not?

A. I know it—I believe it from the evidence of your map only.

Q. Now, I call your attention to the Fir tunnel level. You have the blue end indicating the fault in the portion I show you here. I will ask you if in

(Testimony of Walter H. Wiley.)

fact that is not only on the vein, but if there is not from six [875—830] inches to one foot of good galena showing right at that point in the Fir tunnel level.

A. That is correct as regards one portion of your question, and wrong as regards the other. It is not in my opinion upon the vein. It does have some excellent galena. Along the line of that fault, if I may explain, from this line downward over the edges of these ore bodies there has necessarily been a great deal of crushing of the ore as well as of the country rock, and we have the drag and that is a case where there is excellent ore along the plane of the fault and outside of the vein.

Q. How much ore did you see there?

A. There is in the face of that tunnel ten to twelve inches of very fair ore; I should judge it is, I did not assay it.

Q. Correcting myself, isn't there three feet of ore in that portion of the tunnel? A. No.

Q. Any place in the vein?

A. Well, that depends on what is ore. There is a ten or twelve inch streak of excellent ore, and it is possible that the material on either side of that might [876—831] assay. How rich it must be to constitute ore I don't know.

Mr. DINES.—I will ask the stenographer to mark this photograph for identification.

Photograph marked for identification Plaintiff's Exhibit No. 17.

Q. I will ask you if the photograph that I have had

(Testimony of Walter H. Wiley.)

marked Plaintiff's Exhibit No. 17 is not a correct representation of the ore, the darker portion of it showing the ore and the lighter portion of it showing the cross material, at the very place shown on your model, colored in blue?

A. That is correct, with this explanation, that there are two different degrees of lightness, and fault material as shown in there, the ore being shown in the darker streaks from ten to twelve inches in thickness.

Q. Do you call that ore there, that dark streak?

A. I do.

Mr. DINES.—We offer Exhibit No. 17 in evidence in connection with this cross-examination.

Q. Do you call that ore there drag? A. I do.

Q. Do you not know that what you call drag there is [877—832] not even within the fault material?

A. It is in this case within the fault and within the fault material.

Mr. FOLSOM.—Mr. Gray thinks that this photograph is objectionable on the ground that it could only be introduced in rebuttal. It is incompetent under the rule in this State, and we object for that reason.

Mr. DINES.—I understand the objection goes only to the order, that is all.

The COURT.—Yes, it would be more in consonance with the ruling of our Supreme Court to keep it until your rebuttal.

Mr. DINES.—I understand. I am not familiar with the rules in this State, but in Colorado we can

(Testimony of Walter H. Wiley.)

introduce evidence during the cross-examination, as part of it.

Mr. FOLSOM.—Well, we will withdraw our objection.

The COURT.—It may be admitted. I think it comes in very nicely, myself, with the cross-examination.

Mr. FOLSOM.—Personally I agree with your Honor. Mr. Gray disagreed with me, and I bowed to his wishes, but we will waive our objection. [878—833]

Said photograph admitted in evidence and marked Plaintiff's Exhibit No. 17.

A. May I explain this?

Mr. DINES.—Q. Yes.

A. This shows very nicely the breast of that drift, on the Fir tunnel level, looking at the breast. The fault material is shown by the lighter colored material, and also in fact the entire width is all fault material, but in this fault following down along the dip is a streak of excellent ore in the darker outlines, of galena, shown fairly sharp on the upper side and more undulating on the lower edge. The material under that on the ground shown in the picture is entirely different from the ore above. This picture also shows one other point within the face of that drift, and that is that there are drill holes; there is one shown very distinctly, which were drilled in there with a machine drill, and have never been shot.

Q. The drill hole you speak of is in the fault material. A. In the fault and in the ore.

(Testimony of Walter H. Wiley.)

Q. Now, I will ask you that if that ore that I have called your attention to in Plaintiff's Exhibit 17 is [879—834] connected with the vein?

A. It is connected with the vein, yes.

Q. Is it a part of the vein? A. It is not.

Q. You say, although it is connected with the vein that it is not a part of the vein, because you think it is drag?

A. It is drag on the fault plane, and not in the vein.

Q. Is it not true that a definition of drag is vein material that has been broken off by the fault movement, and necessarily lies in the fault material, in the gouge, and behind the line of movement?

A. It lies in the line of movement.

Q. But behind the moving body, does it not?

A. Behind the vein, but in the fault.

Q. Behind the moving body.

A. The line of movement is not a simple line; it has a material thickness.

Q. You mean by that the gouge.

A. The gouge, the broken quartzite, the ore that is carried in the fault also is all a part of the fault.

Q. Let me illustrate by two pencils, if you please; suppose this is a vein or a section of a vein where a fault [880—834] movement has caused these to separate in this way. Now I have moved one of the pencils downward along the fault line, and it is in the fault line that you would look for the drag, from this point up to the point where it broke from, wouldn't you?

A. If you had two pencils moving, yes, but if you

(Testimony of Walter H. Wiley.)

had two masses of rock which had moved six thousand feet, you would expect to find that drag material at any point in the vicinity of the end of the vein, and maybe for long distances beyond.

Q. Isn't it a fact that you find in connection with the Osborne fault and with its fault movement little evidence of drag?

A. We find less evidence than I would expect in so great a fault.

Q. You have a fault movement in this case where the vertical displacement amounted to more than six thousand feet, didn't it? A. I don't know.

Q. What is your best opinion on that subject?

A. I have no opinion, except that there has been an extensive movement. The Geological Survey says six thousand [881—836] feet and I have no cause to doubt their assertion, although I don't know whether it is so or not.

Q. Was that movement a sudden movement or a movement possibly by inches and running over a long period of time? A. Probably very slow.

Q. Covering many years, many hundreds of years.

A. Undoubtedly many millions of years.

Q. Then you would not expect, when you find a movement extending over so great an extent and covering such a great period of time, to find much evidence of drag, would you?

A. I don't think the time element cuts any figure in it; perhaps I should explain; that sounds like I was talking in a visionary way. When I say millions of years, that is simply based on the fact that if

(Testimony of Walter H. Wiley.)

we had a sudden drop of six thousand feet of one part of the mountain relative to the other, we would necessarily have a precipice; one part would be higher. There is nothing of the sort here, so I assume that it took as long for that fault to move down as it did for the natural agencies to erode the surface to an equal depth, so it took a very long time.

[882—837]

Q. If the movement was sudden, would not you also have had fusion, from the heat of the movement?

A. Well, there may have been some San Francisco earthquakes or something like that when it dropped. I don't know about that; I am not informed.

Q. And where—and a small vein like the Senator Stewart, compared to the great mass of earth involved in that movement, you would expect that in a movement of six thousand feet, to leave hardly a pencil trace, wouldn't you?

A. No, on the contrary I would expect to find considerable, when such an enormous mass moved such a great distance, that this material would be found in the line of movement, not only downward but laterally.

Q. Isn't the quantity of that material deposited over such a great distance a question that you would necessarily look into before you reached a scientific conclusion on that subject?

A. I would not expect to find the trace of this material extending up in the air like the tail of a meteor six thousand feet; I would expect to find in certain places in there where the angular edges had rubbed

(Testimony of Walter H. Wiley.)

off the ore much more than it has. [883—838]

Q. I was not referring to that portion of it that must have been up in the air, left up above, but I am asking you this question; isn't it true—and I don't understand you to deny it—that there is very little evidence of drag connected with the Osborne fault?

A. There is evidence of drag, but not as much as I would expect. That is due partly to the fact, probably that the ore—when I speak of drag there I mean drag of ore—and it is due largely to the fact that the ore is very soft, and you often find on the ends of the fault a black material, or the galena, has been so finely comminuted and divided that you cannot recognize the structure of the galena from which it was made at all.

Q. Now, is the explanation you have given as to drag the explanation that you give the Court for not putting the same indication in red for this material on the Fir tunnel level at this end to indicate that there is vein material there?

A. There is no vein material there, except as this drag here occurs in the fault.

Q. Well, it is there, isn't it?

A. It is there. [884—839]

Q. I am not asking you what put it there or how it came there; I will relieve you of the responsibility of that. Does that level correctly represent, as seen in red, where there is vein material and ore?

A. It does.

Q. In all places? A. It does.

Q. It does not in that place.

(Testimony of Walter H. Wiley.)

A. It does represent where there is vein.

Q. You have admitted that there is vein material and ore there; you say 12 inches and I say three feet as shown in that photograph, and you have given nothing to indicate it on that model. Do you think that your model, on which you have said that the vein material is shown to the Court in red, will give to him a correct idea of the conditions, when you explain that you find it there but you did not put it on there because you classified it as drag ore instead of part of a vein?

A. It will because this is in the fault. That is not the only place where there is some ore in the fault.

Q. Well, I will show you some other portions that you have not painted in red; you do not seem to be able to find them. I will try and find one or two more. [885—840]

A. I can show you some.

Q. Well, I understood you to tell his Honor that you could only think of this. If you have another one that you wish to point out to him, you may.

A. I was speaking of the vein. Here is a working at the 200 foot level which I did not describe, and where there is a difference as to where the fault goes, and it is shown at the end of the 200 north crosscut. In that case there is considerable ore along that fault, and there may be some actual mineralization in that fault at that point.

Q. You said nothing about that in your examination in chief. A. No, I did not mention that.

Q. Is the fact that you have the vein very clearly shown by the paint you have indicated on this model,

(Testimony of Walter H. Wiley.)

that is, the 200 north crosscut and the drift, is that right? A. That is correct.

Q. Now, there is a raise at that point, is there not?

A. There is a raise which is inaccessible except at its lowest portion.

Q. Do you know where that raise goes from that part [886—841] of the 200 north crosscut?

A. It goes right from the end of that crosscut, or just about.

Q. How far is that raise?

A. It goes up at least sixty-four feet; how much higher I do not know.

Q. Is it on the vein?

A. It is upon the fault itself. It is called the vein, and there is some mineralization there, which is away from the vein.

Q. You have never been up in it yourself?

A. No, not beyond that point.

Q. But you do say you do believe it is the vein, do you? A. No, it is not the vein.

Q. Then you are not answering from your own information or from any actual observation that you made yourself as to that raise.

A. Yes, there is mineral in that raise, in that lower portion, I know that of my own knowledge.

Q. But you don't know how extensive it is?

A. I don't know how high it is. [887—842]

Q. Is that the reason you left it off entirely from this model?

A. No. It evidently was not surveyed, and was not put on the model.

(Testimony of Walter H. Wiley.)

Q. There was no purpose in having your model show at that point absolute fault material all through, and in leaving out that portion?

A. It was not left out. The drift itself, which shows the direction, is on.

Q. But this upraise, 64 feet high, I understood you to say—

A. That is not on. That is an extremely difficult place to get at. I don't believe a man could get in there to survey it. I crawled through a very small hole to get there.

Q. Is it not true that what you call a fault at the portion concerning which I last interrogated you, I mean in reference to the raise running from the 200 north crosscut, that the fault that you referred to as existing there, was absolutely cut off by the Osborne fault and is shown in those workings to have been absolutely cut off by the Osborne fault? [888—843]

A. No, it is certainly not cut off by the Osborne fault.

Q. How much investigation did you make to determine that fact?

A. I investigated that as thoroughly as the circumstances would permit; in fact I waded through three feet of water and got out into the crosscut which runs north of it for the purpose of seeing what was in there, and I examined it as thoroughly as possible as to the conditions there, and I decided that the fault in that drift was itself the Osborne fault.

Q. Is it not true that at the east end of the 202 drift, that is the drift which you refer to, there is

(Testimony of Walter H. Wiley.)

plainly a cutting off of that fault by the Osborne fault?

A. No; on the contrary, there is plainly at that point a continuation of the fault which is shown in that drift, onto the east in the side of the drift.

Q. Now, you made a cross-section that you passed through what you term the vent, if I understood you correctly, and you laid your pointer as you now lay it, pointing from the vent to about through the upper portion of the stope of the Gray ore body. Did you have any particular [889—844] reason selecting that particular place for a cross-section?

A. Yes.

Q. What was your reason?

A. That there we had the highest disclosure of what is said to be the vein on the surface.

Q. What do you mean by the highest?

A. The vein at the surface, and we also had the Gray ore body beneath the Ontario claim.

Q. Isn't it a fact that a cross-section a little bit more to the south and west would show you clearly that the dip of this assumed upper vein is entirely wrong and could not be correlated in any way with the vein below, as far as dip is concerned?

A. May I hold that?

Q. Yes.

A. I think the best answer to your question is simply to sight along the strike of the vein to the line of this assumed cross-section. The raises above the lower Stewart tunnel level upon the vein align remarkably closely with that pointer, and it strikes me

(Testimony of Walter H. Wiley.)

that that kind of section would have been better than the one I took, [890—845] as far as it appears upon this model.

Q. Now, let us see—we will ask some questions about that in the Samuels raise. What did you find to be the dip of the vein there?

A. I explained in my direct testimony that my examination of the Samuels raise and the workings from it was very unsatisfactory, because they are almost entirely caved. The raise itself is a steep working, and down in the footwall; it certainly does not follow the vein, although it is closely timbered.

Q. Isn't it a fact that the vein shown in the Samuels raise has a dip of from sixty-five degrees to vertical?

A. I think it is a fact that the raise disclosed in the tunnel at the head of the Samuels raise goes down very much deeper, due to the presence of a small fault which I have mentioned.

Q. If you had passed the cross-section through that portion of the vein which is shown in the dip of the Samuels raise, you would have had a very different condition from that which is shown in your cross-section "J," wouldn't you?

A. If we had taken a cross-section from the vent down [891—846] in any direction, we would have had a similar condition to that shown upon cross-section 5. If we had taken a local dip and a short cross-section at the south end of the upper Stewart tunnel, we would have had a different condition caused by this local fault.

(Testimony of Walter H. Wiley.)

Q. You have never seen any vein going up to that vent? A. I have not.

Q. How many feet have you been from the vent in its nearest point, and by that—and by the vent I mean this metal slip on the wire on the model; how near have you been to that vent at the nearest point?

A. Not within 100 feet of it underground.

Q. Now, you are assuming the vein; you take the vein going through the vent, and assume that that is the vein. I assume that that is an unwarranted assumption; then you take a plane and pass it through the Samuels raise and going down on the lines that you would have to go to encounter the ore body in question, I will ask you if you would not have a vein dipping and showing a very different dip from the arrangement that you have on Exhibit “J”?

A. I mean, as I said before, that a portion of the Samuels raise had a steeper dip, caused by a small fault. [892—847] I would like to explain, if I may, as to this matter of unwarranted assumption.

Q. Well, I mean that that is what we claim. I did not mean to use that term in any offensive sense, you understand, but that is our claim.

A. I understand first as to some of these workings, that they were put on from information received from Mr. J. M. Porter, who may be able to tell you something about them. The assumption that it continues up toward the vent, however, is not based alone upon the fact that there is an upraise there which is made from some point below on an incline, but it is based also upon the fact that in the upper

(Testimony of Walter H. Wiley.)

Stewart tunnel we find a vein continuing upward in such a direction, that, if it continues on its course, it will come almost exactly to the point where we do find this ventilating box on the surface, so that I think I am fully justified in the assumption that it is extremely probable that that vent at the surface is the top of the vein which is seen in the tunnel below.

Q. You think then that the assumption is not unwarranted? A. I think so. [893—848]

Q. In making your assumption did you take all the physical evidence that was there in the ground that you could take, before you made it? A. I did.

Q. Are you familiar with the shaft in the Quaker Fraction? A. No.

Q. And the drift which runs from it?

A. No, I have not been in the shaft.

Q. Is it not true that at a known point closer to that vent than the point from which you have jumped there is a vein dipping to the northwest shown in a drift and shaft in the Quaker Fraction?

A. I haven't seen it.

Q. Did you try to see it; did you investigate it?

A. I made a hurried trip there. I have seen no such vein.

Q. Mr. Porter never told you about that when he was giving you information which you say you used in making this model?

A. No, I did not discuss that proposition with Mr. Porter. [894—849]

Q. Now, just west of the section which we are dis-

(Testimony of Walter H. Wiley.)

cussing, your Exhibit "J," there was a winze, was there not, or at least a raise; it is a working from a level in here, from a drift on the vein at the point that I have shown—it is not shown on your model, a raise from that drift up to this little point that I show you on the model?

A. There is a little sublevel just a few feet below this point, through which you pass from the Samuels raise to this drift, yes.

Q. Why didn't you show that on the model?

A. That is practically a continuation of this same point; it is just a few feet under there.

Q. It still shows the vein, does it not?

A. Yes.

Q. And shows where the vein is cut off by a fault, does it not?

A. No, I don't think the vein is cut off by a fault there.

Q. There is no fault in there?

A. Further to the south there is.

Q. What fault further to the south is it that cuts [895—850] it off?

A. A cross-fault which you call the Ontario fault, which does cut off the vein there.

Q. Is that the Ontario fault? A. It is.

Q. You have not always been of that opinion, have you? A. Yes.

Q. I think you called it a vein once in testifying about the Ontario?

A. Faults are often veins, and veins are often faults.

(Testimony of Walter H. Wiley.)

Q. Didn't you in the Ontario case differ from Mr. Winchell; Mr. Winchell said that was a fault and so classified it, and didn't you say it was a vein, and in that litigation in reference to the Ontario claim your contention was that it was a vein?

A. I called it both a fault and a vein. I don't remember exactly my testimony in that case, but it is a vein where it is mineralized.

Mr. FOLSOM.—They were both on the same side in that case, Mr. Dines.

Mr. DINES.—I understand that, but they were not [896—851] both on the same side on that question in the case.

Mr. FOLSOM.—No, I think Mr. Winchell was unwilling to concede all that Mr. Wiley wanted to claim.

Q. Now, you called that a vein in the Ontario case, and you call it a fault in this case?

A. That might easily be, yes.

Q. Then it might be a vein at some portions, and a fault at others?

A. If a fault fissure is sufficiently mineralized to be extensively developed, as it was in the case of the Ontario near the surface, and ore found at numerous points although not in payable quantities, I would be willing to admit it was a vein which the miner would follow, hoping to find ore.

Q. It would take a good deal of drag ore in the breccia of a fault, to change it from a fault to a vein, would it not?

A. Well, you don't understand me, or something

(Testimony of Walter H. Wiley.)

else. A fault fissure is often a mineral vein, that is, there has been movement along the plane of the vein, which makes it also a fault.

Q. But in this case, in the Ontario case, you had [897—852] some inclusions of ore, in the form of foreign material, as Mr. Winchell claimed, that had been put in there, not in the form of the deposition of ore by solutions which went up in the fissure, but as absolutely foreign matter put in there; do you say that that made it a vein or not?

A. Perhaps Mr. Winchell and I differed. We sometimes differ even when we are on the same side.

Q. Now, the Ontario fault, you think, cuts off this vein at the point that you have indicated on the model, or at what portion from the point last under discussion? A. Extending south.

Q. At that point? A. Yes.

Q. That was the blue that you indicated by the blue on this little branch that goes out there?

A. That is marked by two blue lines crossing the drift in the direction I now hold my pointer.

Q. Did you take the strike and dip of the Ontario fault at that place?

A. It has a southeasterly direction and dips toward the southwest. [898—853]

Q. Now, did you examine the winze, or if you prefer to call it a raise—I don't know which it is—it is either a winze running from this level at the top of the Samuels raise, or it is a raise coming from the intermediate level known as the 145, I believe, up to that?

(Testimony of Walter H. Wiley.)

A. No, I could not get in there except in the cross-cut from the shaft.

Q. Then you cannot state of your own knowledge what that shows? A. I cannot.

Q. And you cannot therefore say of your own knowledge, Mr. Wiley, whether or not, before the ore reaches the bottom of that winze it is cut off?

A. I said that in my direct examination that it is extremely likely that within this space there are some faults with small displacements, simply reasoning by analogy that I found small faults all through the Stewart mine.

Q. Did you examine the crosscut—there is a cross-cut at that point also, which I believe is not shown on your model? A. Where?

Q. Is there not a crosscut—is this crosscut a little lower in the plane [899—854]

A. There is a crosscut down here extending out from the Samuels raise, a drift extending south from that, and a branch from the end. I have never been in it.

Q. Is this a crosscut indicated here?

A. That is a crosscut which is put on there from your map.

Q. And you don't know what that shows?

A. I do not. It was said to follow the Clancy fault; that is why it was especially put on there, to show the Clancy fault.

Q. Now, in your cross-section, what is the difference from the point where you saw the vein disclosed, the vent, measured on the incline?

(Testimony of Walter H. Wiley.)

A. About 130 feet.

Q. Then you have there 120 feet of projection?

A. There is more than that from the point where we had the vein.

Q. You mean from the point where you saw the vein?

A. From the point where I saw the vein to the surface is about 200 feet.

Q. Now, there is a little working shown in the upper portion of this and right underlying the vein with some dotted lines. Was that working in your section? [900—855]

A. That is the working shown also upon the model, and which I said would be explained by Mr. Porter. It is not upon the immediate plane of the section, and is shown on the cross-section in dotted lines.

Q. At the point where those dotted lines are shown going into the vein here, was that a projection of the vein, that is the showing at the east of the vein over here is it projected to that point, for the purpose of determining the position of the vein in any way?

A. No, only in this, that the vein is seen in the tunnel with its dip, it is continued upward from there, and at the point where it intersects this raise or vent it is substantially in a straight line.

Q. You have already explained that in taking your assumed dip indicated by your broken red line down to the blue on Exhibit "A," that you have taken a dip of about 40 degrees?

A. I have, and I so marked it on the section.

Q. You did not, in taking that assumed dip, take

(Testimony of Walter H. Wiley.)

into consideration the dip of the vein as shown in the Samuels raise and the workings immediately in connection where it runs from 65 degrees to vertical? [901—856]

A. Certainly not, where it is along the fault and away to the south of this section.

Q. But that was a known portion of the vein covering the section that is shown by your section?

A. By no means.

Q. A projection, was it not?

A. By no means covering that section.

Q. How far is it from it?

A. The section in the model covered by this cross-section five is as shown by my pencil, near the north bend of the drift on the upper Stewart level. The Samuels raise is shown upon this model about 200 feet south of this line.

Q. Well, you have a projection from this point where you saw the vein to the vent of 200 feet, so it would not be out of the way to project the other way, where you had known vein opened up?

A. That is entirely a different proposition. This was not a projection of the vein, but simply an assumption of the continuation of the vein in the direction in which I saw it going.

Q. Well, you do identify the fault given here as the Clancy fault on section J? [902—857]

A. I do not identify it as the Clancy fault of my own knowledge, but I assume that the statements of the plaintiffs in the case as to the continuation of the Clancy fault are so.

(Testimony of Walter H. Wiley.)

Q. And that is all that you made up your opinion from, is it?

A. In connection with the fact that I have seen the Clancy fault at two points, or I have seen faults which may be the same and which probably are what has been called the Clancy fault.

Q. But you cannot positively identify them as the same? A. No, by no means.

Q. Neither can you positively identify the vein that you assume to be up under the vein with the vein down beneath the Clancy fault?

A. Oh, that is a different proposition.

Q. I am not asking you that; I am asking you if you can identify it.

A. Yes, much more nearly. Now, may I explain that?

Q. Yes.

A. We have one vein, and we have many faults. We find a fault here and we go a few feet and we find another one. [903—858] But where you have only one vein and you find two sections, it is a natural assumption, if they are pretty near in line, that they are the same.

Q. But you stated that if the top of the vein as shown in the Samuels raise is taken at from 65 degrees to vertical, you would have an impossible identification, would you not; upon that at least you would not commit yourself to an opinion as to their being the same vein, would you?

A. The vein in the Samuels raise may be the same vein, that is, it may have been the same vein at one

(Testimony of Walter H. Wiley.)

time, and it has been dislocated by the fault; just as I am willing to say that I believe that the Gray stope and the Frank stope were at one time portions of the same vein although to-day they are widely separated.

Q. Now, the north end of the drift is not shown in your model running northerly from the Samuels raise? A. Whereabouts?

Q. 179 feet. About the old lower Stewart.

A. I don't know personally as to that, except that there is a crosscut down here and two drifts extending from that crosscut. They are inaccessible, and I know nothing of them. [904—859] The same work which is shown upon the map is shown upon the model.

Q. Yes, but you heard the testimony about them, did you not, the plaintiff's testimony, the same as you heard other parts of the plaintiff's testimony that you have introduced into your model?

A. I don't recall the details of it if I did.

Q. Well, you concede that any disclosures that were made in that drift running northerly from the Samuels raise, 179 feet above the old lower Stewart tunnel was not taken into consideration by you in making your model, is that right?

A. In making the model, there may have been a drift left off.

Q. I will grant that, but I am not asking you that. It is apparent that the drift is not there, but I am asking you if the information that that drift disclosed to the one who examined it was taken into con-

(Testimony of Walter H. Wiley.)

sideration by you in making your model or arriving at your conclusions?

A. No, because I don't know what is in there; but I do mean to say that it is entirely south of this line, and that that mass or ore through the Samuels workings was in places carried down by a subsidiary fault, and a fault not affecting [905—860] the vein further north.

Q. A great many things may happen?

A. A great many things have happened?

Q. Yes, and one of the things is that there was a vein in there in the very point that you have left off of your model, which I will tell you, from information that I have received—because I am like you, I have not examined it—has a dip of 70 degrees to the southeast and 12 inches of galena ore in it, showing there, stoped from there. Did you have that information?

A. I did not; but even then, that occurrence could not be indefinitely carried on the strike of the vein and assumed that that is going to break the continuity of the vein throughout. If so, then the break in the continuity of the vein between these ore bodies must have been continuous. The distance in this case, even if there is ore in those lower workings, and even if that is a faulted section of the ore above—the distance to which the assumption of a break can be carried is necessarily limited, as proved by the developments in this line in the fault deeper down, the No. 11 fault and this other.

Q. Now, your counsel, Mr. Gray, questioned our

(Testimony of Walter H. Wiley.)

right [906—861] of projection, and called it a projection of 180 feet, where it was 180 feet between two known points. You have projected much more than 180 feet on your cross-section between unknown points, have you not?

A. I have not projected; I have assumed a continuation of the vein between known points, just as I have assumed a continuation going down between known points; in other words, I did not pass continuously on that line of section on the vein.

Q. But you had two known points below to guide you in your projection, and you did not have two known points above?

A. Well, I had three points that someone knows about.

Q. Not in the same plane of section, are they?

A. Yes, substantially so; closely.

Q. Now, did you know the dip of the fault that cuts off the vein in that level immediately below the Samuels workings that you have shown here?

A. No, I have never seen it, and necessarily I do not know.

(Recess.)

Q. Mr. Wiley, I think it is fair to you to say that in [907—862] Plaintiff's Exhibit No. 17 I think I myself misled you by a question, and I wish to call your attention to that exhibit, and to say to you that the picture was turned upside down, and that the drill hole that you referred to, and which I thought was in the fault material, is not in the fault material.

A. I would like to say to you in reply that I do

(Testimony of Walter H. Wiley.)

here, and that you can still get to every [910—865] part of it, and to every raise from it at the present time. A. That is perfectly true.

Q. That is correct, is it? A. Perfectly true.

Q. Then you did not mean to be understood as telling the Court that you had no opportunity to examine this drift known as the east drift from the Samuels raise?

A. On the contrary, if the Court so understood me, I wish distinctly to explain that I meant to say that the portion of the work that I could not examine is that between the Samuels raise—and when I used the term Samuels raise and Samuels workings, I did not mean to include the upper Stewart tunnel level.

Q. The upper Stewart tunnel level is a crosscut tunnel?

A. It is, with drifts extending from it. It is in a peculiar shape; it runs as a crosscut, and then runs back as a drift, doubling back partly in its own direction.

Q. Then you have no vein shown in the Stewart tunnel, unless you call this a vein in the little upraise that you have marked on your plan map? [911—866] A. That is correct.

Q. Is that a vein in there?

A. No, that is not a vein. That is a little crosscut in there.

Q. Between point L 5432 and 5433?

A. Yes. This is a crosscut run through the vein, and there is no development on it. Then they wind clear around and caught it and came back. They

(Testimony of Walter H. Wiley.)

could have done their work in a much shorter way.

Q. Now, the vent that you refer to, is shown on the map here immediately above the upper Stewart tunnel level, and designated 3190; just above 3190, marked "Vent." It is marked vent, elevation 3190.

Q. That is the elevation of the vent, is it?

A. It is.

Q. Now, you have elevation 3203 immediately adjoining that; what elevation is that?

A. I presume it is that Quaker Tunnel crosscut.

Q. Now, the Quaker shaft to which I call your attention, is shown on this exhibit? A. Yes.

Q. And the drift running from that is shown on it? [912—867] A. Yes.

Q. Out toward the vent? A. Yes.

Q. Do you know whether or not that drift is on a vein?

A. No. I went down there hurriedly; I did not see a vein; it was late and I was very hurried, and I would want to see that again before being absolutely certain what there is in there.

Q. Are you willing to say it is not a vein at the present time?

A. My impression is that it is not a vein, but it may be; that there is vein material in there in some places.

Q. Do you know whether that drift is any more than 30 feet long?

A. I don't recall its length. I have not seen it since last fall.

Q. Is it not true that the vein is cut in the shaft at a point on the side of the shaft, and it is shown in

(Testimony of Walter H. Wiley.)

the drift all along, and is in that 30 feet of distance, unless it has been driven further by you since, of about 30 feet in to the face, and that the vein is showing?

A. There is a great deal of surface debris in there, [913—868] and in the hurried examination I made I would not want to say just as to what is shown in those workings.

Q. That drift is running toward—not directly toward but in somewhat of a curve toward the vein, is it not? A. Generally in that direction.

Q. Do you know the depth of the shaft?

A. No; it is 30 feet or something like that.

Q. Do you recall the 85 foot level in the Samuels raise?

A. I said I had been in the crosscut, but not in that drift.

Q. Then you don't know whether there is any fault gouge shown in that point or not, or any vein?

A. No.

Q. Is there any fault gouge below that point on the lower tunnel level?

A. Below the Samuels workings on the lower tunnel level, immediately below?

Q. Yes.

A. I don't recall any. There are faults at numerous points in the lower tunnel level in that vicinity.

Q. In the 145 foot level was there any stoping done [914—869] from that level? A. I don't know.

Q. Above it? A. I don't know.

Q. Do you know whether or not there was stoping

(Testimony of Walter H. Wiley.)

underneath the fault, and whether or not the fault at that point forms the hanging-wall of the vein?

A. I don't know the conditions as they existed there at the time the work was done.

Q. Now, in drift 415 in your model you have shown a portion of that drift in red, then you have a fault out to one side here in the Ontario workings, or a blue mark which I suppose you intend for a fault.

A. Wait a minute; there is one thing that I omitted. There is a place here where it is painted black, that is, the same color as the standards. These drifts do not connect, and for the purpose of holding these two together, the man who made the model left that connection through there, and then painted it black, showing that that is just a standard, and is not intended to represent anything.

Q. The black part of drift No. 415 does not represent [915—870] anything?

A. It is simply a support, the same as the black of the standard.

Q. You have red showing in drift No. 415 west, but you have no ore showing along the sill floor or no vein material showing?

A. No, the vein is shown continuing, and is connected from this point through continuous stopes with the 300 foot level above.

Q. Then you do not mean to say that these points on this level where it is colored gray—that there is not a continuous vein between them, do you?

A. Yes, I do.

Q. You mean there is not a vein there?

(Testimony of Walter H. Wiley.)

A. Yes. The vein lies over.

Q. Is there a vein over it continuous?

A. Yes, and stopes on that vein, absolutely demonstrating the continuity of the vein from the 300 down to the 400.

Q. Isn't it a fact that on that sill floor there is ore all along these points that you have failed to color with red?

A. There is some low grade ore in places there under the footwall of the quartzite. [916—871]

Q. It is vein, isn't it? A. No.

Q. It is not vein? A. No.

Q. It is just ore?

A. It is very low grade, I should judge, from the appearances. I took one sample low.

Q. It is not quartzite, is it? A. Yes.

Q. Altogether?

A. It is quartzite which is mineralized by lying immediately under this large ore body.

Q. Wasn't it as well mineralized as the Ontario fault?

A. Well, the Ontario fault in places had some solid galena.

Q. Now, wasn't this part in here that you have failed to color red as well mineralized as that Ontario fault? A. No.

Q. It was not as well mineralized? A. No.

Q. Well, we see where our differences of opinion come, then. You positively state to the Court that they have [917—872] no vein material between those red parts, do you?

(Testimony of Walter H. Wiley.)

A. I mean to state that there is minerals in places in this quartzite outside of the vein, not only in that quartzite, but back in the slates in the footwalls there are specks of galena that you can find away back.

Q. I am not asking about that; I am asking about this. Is that quartzite mineralized between those points where you have omitted the red on the model, drift 414 west? A. In spots, to a limited extent.

Q. All along?

A. No, or it wouldn't be in spots.

Q. At spots. Why didn't you give us the spots; you gave us the spots up here in red; why didn't you give us these spots?

A. Those are in the vein, and these are in the quartzite through this large body of ore lying over there, which has impregnated in some cases the country rock immediately adjacent to the vein. They are not mined at all, but there is a little mineral, just as there are specks of mineral even back here in the Fir tunnel, away back of this that we have called the vein, or the fault there.

Q. Now drift No. 205 west. If I do not misquote you, [918—873] I think you located a fault in there?

A. There is a fault marked on the model at the point you indicate, and one still further to the south.

Q. Do you identify the fault which is marked on drift No. 405 west as the fault which causes the separation of the Frank, the Gray and the May ore bodies?

A. Yes, possibly a splitting of that fault upward,

(Testimony of Walter H. Wiley.)

so that above it branches, or a part of the same fault below.

Q. Now, it does not have as much throw or as much effect upon separating the vein at the point in drift 205 west as it did in the workings of the Ontario, does it? A. It does not.

Q. What is the difference in the effect of that fault, at the point drift 205 west and between those ore bodies in the Ontario?

A. The separation of the ore bodies is much less.

Q. Do you know how much less?

A. Than in the upper workings. It is about 80 feet in the 200 foot level, and it is nearly 180 feet in the workings below.

Q. Isn't it a fact that instead of the fault at drift 205 west on the right-hand side of that near the top of [919—874] raise 314 west being the same fault, that that fault is found here in the west on drift No. 205, as marked on the model?

A. As I stated they are perhaps—possibly both of those faults are branches of the one below.

Q. And taking the one to the west of drift 205 west there is in the stope immediately above that in the Stewart workings a plain effect of a fault in the way of gouge, but not enough to separate the vein?

A. That is true.

Q. Then don't you think that the fault is lost right there where it shows its last effect on the veins as you know it?

A. Well, I would not want to say that, because the plane of fissuring continues.

(Testimony of Walter H. Wiley.)

Q. But the separation is no longer present in the stopes, is it?

A. The stope is continuous on both sides of the fault. There has been some little faulting, but not sufficient to disconnect the vein.

Q. You distinguished the fault, the place that the fault would have occupied, if there had been a separation, by the [920—875] gouge that is disclosed in the stope? A. Yes.

Q. Well, what is the strike and dip of the fault which you think may be a part of No. 11 fault which is shown on the level to the right on drift 205 west, or to the southeasterly of it, compared with the strike and dip of that fault as shown in the Ontario ore bodies down at the point to the northwest of drift No. 205 west, indicate how it is disclosed in the stopes?

A. It does not correspond in strike with the fault below; it however, has such a dip that if continued down it would correspond; in other words, it is the same fault, it is simply a warped surface that is bend around.

Q. You could not identify that, as far as the strike is concerned, as at all the same?

A. They do not correspond.

Q. Is there any difference in the dip of the two faults disclosed on this level at drift 205 west, on each side of the lettering?

A. That is timbered rather closely there, and I would not want to say just as to the condition. It

(Testimony of Walter H. Wiley.)

has a rather flat dip as I recall it through there.
[921—876]

Q. Now there is nothing in the ground that enables you to identify fault No. 11 positively, above the stopes to which you have just referred over drift No. 205 west, is there?

A. Not positively, there are faults above which may be, and which probably are, some of them the same fault.

Mr. FOLSOM.—You are referring to the west branch of it, Mr. Dines?

Mr. DINES.—Yes, referring to both branches, both of them. I think that is correct of both branches.

A. There are faults as shown by the blue coloring higher up which may or may not be the same fault.

Q. And they do not correlate in dip or strike?

A. Not exactly.

Q. And if you did identify them as the one, there would have to be, as you have described it, a warping in each instance, except that you can identify that at drift No. 205 west on that level with that between the two ore bodies in the Ontario?

A. No more positively than I can identify them above. I believe this is one branch of the same fault.

Q. Well, the dip and strike correspond more nearly than they do in the other instance, do they not? [922—877]

A. Not the dip; the strike does.

Q. Now, drift No. 205 east is all in ore and stoped above it, is it not?

(Testimony of Walter H. Wiley.)

A. It is, and stoped above it as far as I know.

Q. And is it not true in the branch that goes out from drift No. 205 east, that that is all in ore, the ore generally all along there?

A. That is not true; I should qualify that by saying that I think that the drift is not accessible now, but some two months ago I did succeed in crawling through some holes there, through some very badly crushed timbers, and it has every appearance of having been stoped above, that is, the chutes go on straight, so that I think it is in ore, in the sense that the vein lies above it, but it is a crosscut in my opinion right in the footwall.

Q. Does that show the same mineralized condition that you refer to in drift No. 415 west? A. No.

Q. Not so much mineralization there?

A. I have seen no mineral in the crosscut itself; however, it is badly crushed and I have not seen every part of it. [923—878]

Q. And of course you don't know what it shows in the places where you have not seen it?

A. I do not.

Q. Now, you gave a course of north 21 east as the strike of this vein; is it not true that that vein you refer to is the one that is found out to the south of the Senator Stewart Fraction and north of the Ontario, south of the Switchback or in the Switchback?

A. That is true. It has a course along the hanging-wall of the vein.

Q. And that is clearly a branch of the Stewart vein, is it not?

(Testimony of Walter H. Wiley.)

A. I consider that the main vein. As proof of the fact that the stopes do come down from the level above, come over to that place.

Q. Well, would you call the Stewart vein then in the workings the branch, then, or this?

A. Which working?

A. Well, the workings of the Stewart, speaking of that vein on which those workings are done, on the Stewart vein?

A. No, they are on some vein which we call the branch, because we find no vein which we call the branch, but the [924—879] stopes go back into the main 300 level.

Q. Isn't a fact that you have a wider departure in this portion of the vein where you get your strike of north 21 east down in the Switchback property than the strike in any other portion that you know?

A. The vein there is more nearly north and south than in any other parts.

Q. And it lies in a different plane of dip from the other portions of the vein in the other workings, does it not?

A. It is flatter from the 300 to the 400 through the stopes, and that is the average dip.

Q. You never got a course of north 21 east in any other part, did you? A. No.

Q. And yet that course of north 21 east that you put in your other averages, it is not that portion of the vein, it is outside of the claim and down in the switchback?

A. I gave the course of each level separately.

(Testimony of Walter H. Wiley.)

Q. Now, raise 214 west is upon ore, is it not?

A. Yes.

Q. And so are the drifts 208 west and 208 east, both of them, are they not? [925—880]

A. A portion of the drift is on ore and a portion is not on ore.

Q. Is it not true that those levels are entirely on ore, well, I will not say ore, but on vein?

A. Well, there are two places where the vein is interrupted by fault.

Q. You have not colored it in fault material?

A. Yes, it is colored with blue here and there.

Q. But you have colored this portion of it in gray?

A. This portion back here which is colored gray was inaccessible.

Q. Well, every time you could not get to an opening, did you mark it as not on vein at all?

A. No. The vein is seen in that level further to the south, and is colored red; the red is even carried out onto the sides of this drift. The vein in my opinion lies over this, and that is a lateral, back toward the foot of the vein.

Q. Isn't it true that for every foot of that distance it is in vein material?

A. Well, I can't say where I have not seen it, and with the explanations I have made, the vein in my opinion lies to the south of it. [926—881]

Q. Mr. Wiley, where you have been going along a working on ore and your commercial ore terminates, but there is vein material still, did you color it on the model red or gray? A. Yes.

(Testimony of Walter H. Wiley.)

Q. So you have not confined the red workings simply to ore?

A. It is the vein, it is meant to represent the vein.

Q. Now, I ask your attention to Plaintiff's Exhibit No. 1, as I am not familiar with the other map. I understand there is a little difference between them. Have you examined the upraise run from the stopes above the Apex drift on Exhibit 1? A. I have.

Q. Did you find a vein in that upraise?

A. In the lower part of that upraise it plainly follows a vein. The upper portion is on a fault coinciding in my opinion with the vein in that section; there you can say that that is upon the vein.

Q. If it be on the fault, the only effect would be to draw that portion of the top of the vein further within the lines of the Senator Stewart Fraction, would it not? [927—882]

A. Yes. I want to say in that connection that the vein is plainly shown by the crosscut from the Apex drift which breaks into caved portions above the stopes, not only this crosscut, but in a drift which is not shown on this map going west, there was a little marking on the side showing that the stopes below lay south of this drift, the same as they did there, only not so far.

Q. Now, is that the top of the vein, that the stoping has been done on below, about in the position there of the Apex drift as shown, drawn a little southerly, if you wish it? A. Yes.

Q. How wide is the vein at that point?

A. It is near the surface and badly oxidized and

(Testimony of Walter H. Wiley.)

crushed by these faults, so that I think it is impossible for anyone to lay his pick on the exact limit of the vein in the ground, but there is a big wide vein there, perhaps 20 feet in some places in width.

Q. Well, the crosscut to the hanging from the Apex drift is about 30 feet long, isn't it?

A. About 30 feet.

Q. And the hanging-wall is not in it yet?

A. Well, I don't know as to that; it is caved, and [928—883] the hanging side is closely timbered to prevent further caving.

Q. And did it cave right on down on the stopes below? A. I presume so; to something below.

Q. Whatever may be said about any little differences about the exact inch or the exact foot of the location of the top of the vein, the top of the vein is within the Stewart lines at that point, is it not?

A. It is.

Q. It can be traced, can it not, from the point marked W2 on Plaintiff's Exhibit 1, in an easterly direction, following the line of the red that is marked on the Apex drift, past the crosscut to the hanging-wall to the point W prime in the same drift as shown on Exhibit 1?

A. The fault which lies immediately under the vein can be traced. The vein undoubtedly follows substantially that same direction.

Q. And that would simply throw the top of the vein a little bit more to the south than as indicated on Exhibit 1 of the plaintiff? A. Yes.

Q. And the throwing of that top of the vein to the

(Testimony of Walter H. Wiley.)

A. Yes.

Q. Where do you mean; at the first point of contact with the Osborne fault? A. Yes.

Q. Now, we have the natural apex along this Apex drift, and in the upraise and in the crosscut to the hanging-wall, and all along that Apex drift, until it encounters the Osborne fault, and that is the place that you think we lose the apex, is it?

A. You certainly do.

Q. We certainly do? A. Yes. [932—887]

Q. Do we lose the apex at that point because it comes in contact with the Osborne fault?

A. No, not for that reason alone, and when I use the term "apex," it is not in any legal sense, but simply as describing the top of the vein.

Q. Well, this is the top, nearest the surface, isn't it? A. Yes.

Q. If I assume a vein—I will relieve you from all responsibility of making it; I will assume a hypothetical vein that has a line of apex, and you see I have this paper marked so it can be read into the record, the degrees, 10, 15, 20, 25, 30, 35, 40, 45, 50. Now, I am assuming, and I will relieve you of all responsibility of assuming that as the top of the vein as it goes indefinitely in its course; I am assuming that by ordinary attrition or the wearing off of the vein by natural processes, it is cut down, in fact I have given your vein an angle of ten degrees (cutting paper with scissors). If it was the top then, is it the top now or the apex?

A. Under the conditions, you state, I would call it

(Testimony of Walter H. Wiley.)

still the top. I will admit, to save time, that you would have the top if you cut it down square.

Q. I would still have it with an angle of 50 degrees? A. Yes. [933—888]

Q. And then if you take 50 degrees, and I cut it in this way, I would still have the original top or apex there of the vein that has been sliced off at an angle of 50 degrees; that would still be the apex down to that point, wouldn't it?

A. That would still be the highest point of that particular vein.

Q. And that would be the highest point, whether it is cut down by the gradual processes of nature, freezing, thawing, gravitation, or whether it is cut off at that place by a fault, would it not?

A. It would, but if you have the condition—I think it is but fair—

Q. Well, wait a minute.

A. I think it is but fair that I should continue and go a little further.

Mr. DINES.—I don't think the witness has the right to take my line of examination.

Mr. FOLSOM.—I was going to ask him about that myself.

Mr. DINES.—Well, if he wants to explain—I will relieve him of all responsibility in that matter and ask him.

The COURT.—I think you can wait until your redirect [934—889] examination.

Mr. GRAY.—It seems to me that if he wants to

(Testimony of Walter H. Wiley.)

explain in this connection he ought to be allowed to do that.

Q. I don't wish to cut you off, Mr. Wiley, if you have anything to explain.

A. If the vein is undercut, as shown by the cut at the lower edge of the paper, then, instead of having a top, we not only have an edge, but we have a lower edge, and how that could possibly be called the top or apex, if it were cut off under here, as it is in this case by the Osborn fault, dipping down under it and cutting the lower edge of the vein,—I can't, for the life of me, figure anything but a bottom.

Q. You think it is a bottom edge; that is, if I assume that this vein at one time had a position where the course of the apex was easterly as indicated by my pointer on Exhibit 1, that if the Osborne fault comes on at a strike of north 80 west approximately and a dip of 70 degrees to the southwest, that that would form an angle of intersection between those planes that is similar to the angle that you cut on the piece of paper and called it an undercut. Is that your statement? [935—890] A. It is similar.

J. H.